ISSUES

Health Effects of Acid Air Pollution

Acid Air Pollution: No Easy Answers

Few environmental issues have captured more attention than acid rain. The thought that invisible, corrosive pollution could be poisoning our woods and waters has galvanized Canadians in support of measures to eliminate the threat. Although acid rain still merits serious concern, emissions of the pollutants that cause it are being reduced. Ironically, while the impact of acid rain on the environment is widely discussed, the effects of airborne acidic pollutants on human health have been largely ignored in the public debate.

Pure Air: Polluted Air

In theory, pure air is approximately 21% oxygen and 78% nitrogen, with traces of other gases. In fact, human activities like the burning of fossil fuels release vast amounts of other substances into the atmosphere; gases, such as sulphur dioxide and oxides of nitrogen, which blend with water vapour to form acid precipitation; and microscopic particles containing acidic chemical compounds like sulphuric and nitric acids. Collectively, these gases and particles, and secondary pollutants such as ground-level ozone, which is formed when nitrogen oxides interact with other pollutants in the presence of sunlight, are referred to as acid air pollution. Air currents transport this mixture whose composition changes constantly, hundreds and thousands of kilometers, across national and international borders. Thus, people far from the sources of acidic pollutants frequently end up breathing air that is far from pure.

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Researchers have explored the health implications of this acidic air pollution for several years. Their work shows a link between high concentrations of airborne pollution and respiratory problems in humans. A dramatic illustration occurred in London, England, in December, 1952. There, 4000 deaths were attributed to chronic bronchitis and other respiratory illnesses aggravated by an acidic smog - a dangerous combination of coal smoke, airborne acids, and water vapour.

Since the introduction of strict pollution controls in the 1960s, such events are rare. Air pollution can still reach hazardous concentrations under exceptional circumstances, but health experts are now probing a more difficult question: can long-term exposure to lower concentrations of acid air pollution also have a damaging effect on respiratory health?

Breathing Easily

Most people take breathing for granted. In healthy individuals, the rhythm of inhaling and exhaling occurs automatically. One need not think about the condition of the trachea or airways, the entrapment and expulsion of foreign particles by the moist, hair-lined inner surfaces of the bronchial tubes, or the resiliency of the tiny air sacs or alveoli where oxygen and carbon dioxide are exchanged in the lungs.

Let one of these vital functions be impaired, though, and the effect is immediately noticeable. It may be a cough, or the congestion associated with an allergic reaction. The airways may become constricted, inducing the wheezing breathlessness of asthma. The tiny hairs or cilia, whose motion helps clear the lungs of foreign matter, may be stilled, allowing the respiratory system to become clogged with mucus. Or the alveoli may lose their elasticity, preventing the easy expansion and contraction of normal breathing.

Tests of lung function can reveal impairments of respiratory health. Under laboratory conditions, it has been shown that exposure to specific acid air pollutants can induce these effects, and actually damage tissues in the respiratory system.

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Similar effects have been observed among populations living in areas where the level of air pollution is high. What remains less clear is whether a respiratory health hazard exists when people are exposed for long periods of time to pollutants in concentrations too low to trigger noticeable reactions.

The Search for Causal Connections

One way to assess the real life health effects of acid air pollution is by epidemiological studies to examine relationships between environmental conditions and human health. The accuracy of such studies is limited by variables such as lifestyle, occupation, and personal habits, even within a single community. Despite these limitations, recent studies in Canada have produced results which suggest the need for further intensive research.

For example, Health and Welfare Canada compared children living in Portage la Prairie, Manitoba, where acid air pollution is low, with children in Tillsonburg, Ontario where the pollution level is relatively high. On average, the Ontario children had a 2% lower lung function, and a somewhat higher incidence of chest colds, coughs, allergies and stuffy noses than their Prairie counterparts. The difference was not dramatic, but measurable. A follow-up study, this time looking at 5 communities in Saskatchewan and 5 similar towns in Southwestern Ontario, found virtually the same results. In Ontario where acid air pollution is higher, children had an average 2% lower lung function.

Another Ontario study drew parallels between levels of acidic air pollution and numbers of people admitted to hospital with respiratory complaints during the summers of 1974 to 1984. More people were hospitalized with respiratory problems on days when air pollution was high. The observations suggest, but do not prove, a link between increased air pollution and increased illness. Yet another study noted temporary reductions in the lung function of girls at a summer camp, shortly after air with high levels of pollution flowed through the area. Again, the results suggest a link.

There are signs that acid air pollution may have indirect effects on human health, too. When acid rain falls on acidic or poorly buffered soils, metals such as aluminum, arsenic, cadmium, and lead may be leached from the underlying rock or plumbing

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systems and enter water supplies. Health and Welfare Canada and Energy Mines and Resources Canada are conducting surveys to identify areas where this condition exists, and to determine whether drinking water in such areas contains abnormally high concentrations of metals.

Proceeding with Caution

There is a profound difference between suspicion and proof. So far, the evidence supports suspicions that acid air pollution contributes to respiratory illness and reduced lung function. There is also good reason to believe that effects observed in tests on animals can be applied to humans, supporting the concern that acidic air pollution may pose a hazard to people's health. The case is not yet proven. Recently, a major health enquiry was launched in 24 communities in Canada and the United States, to correlate acid air pollution levels with the lung function and respiratory health of children. Continued research of this sort is essential.

Meanwhile, rather than waiting for answers to every unknown, we must continue to press for further reductions in the release of acid-causing sulphur dioxide and oxides of nitrogen. In the short term the effort will further enhance environmental quality and should reduce health risks among susceptible groups, such as the elderly and asthma sufferers. Eventually, it could mean reduced medical costs, diminished illness, and saved lives.

For more information, contact:

Toxic Air Pollution Health Effects Section
Environmental Health Centre, Tunney's Pasture
Health and Welfare Canada
Ottawa, Ontario
K1A 0L2
Tel.: (613) 957-1878

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October 17, 1990

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Health Protection Branch

ISSUES

Changes in the Regulatory Status of AZT (Now Zidovudine)

The Health Protection Branch (HPB) of Health and Welfare Canada has recently issued a Notice of Compliance to Burroughs Wellcome Inc. for Retrovir, brand name for the antiviral drug zidovudine (formerly known as Azidothymidine or AZT). Zidovudine is a key drug used in the management of human immunodeficiency virus (HIV) infection, including AIDS.

Physicians will now be able to obtain zidovudine for persons with AIDS and HIV infection, without enrolment in the open treatment protocol as was previously the case. The manufacturer will continue to provide access to Retrovir through the open treatment protocol system while arranging the orderly transition to the usual distribution for marketed drug products. During this interim phase, the manufacturer will inform the coordinators of the open protocol regarding marketing plans. Physicians will no longer be required to submit open treatment protocol reports for zidovudine.

Zidovudine can prolong the survival and decrease the frequency of opportunistic infections in persons with advanced HIV disease. The drug also delays the progression of disease in HIV-infected persons with T-cell counts of less than 500 cells per cubic millimetre who have no symptoms or early symptoms of HIV disease. Children with advanced HIV disease also show improvement with zidovudine.

Zidovudine is indicated for treatment of adults with HIV infection who have T-cell counts of approximately 500 cells per cubic millimetre or less before treatment begins. Zidovudine is also indicated for HIV-infected children over three months of age who have advanced symptomatic HIV disease (pediatric AIDS or advanced AIDS-related complex, ARC). Zidovudine may be of benefit to children who have no symptoms, but have abnormal laboratory results indicating significant HIV-related suppression of the immune system.

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Zidovudine will be available in 100 mg capsules. A strawberry-flavoured syrup containing 50 mg Zidovudine in each teaspoonful (5 mL) will be available for children and patients unable to swallow capsules. Zidovudine injection for intravenous infusion containing 10 mg zidovudine in each mL will also be available.

Detailed information on Retrovir is contained in the product monograph available to physicians and pharmacists on request from the manufacturer.

Zidovudine was initially made available in Canada through an open treatment/observation protocol for the treatment of adults diagnosed with AIDS (October 1986), and severe AIDS-related complex (May 1987).

On September 1, 1989 the Health Protection Branch further amended the open treatment protocol to permit asymptomatic/ symptomatic HIV-infected patients with a T-cell count of 500 per cubic millimetre or less to receive zidovudine. The protocol was also amended to allow these patients to receive a lower recommended daily dose (of 500 mg/day).

Access to zidovudine for children occurred via the Emergency Drug Release Program. Through these access mechanisms approximately 7,500 adults and 50 children have received zidovudine.

Retrovir (zidovudine) will be marketed in Canada by its manufacturer Burroughs Wellcome Inc. of Kirkland, Quebec.

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Changes in the Regulatory Status of AZT (Now Zidovudine) is one of Health Protection Branch Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups interested in health protection in Canada.

Aussi disponible en français.

Health Protection Branch

Issues

Menstrual Tampons - Toxic Shock Syndrome

Tampon Absorbency Labelling

In the coming months there will be changes on the labels of tampon packages. These changes are the result of a co-operative effort between Health and Welfare Canada and tampon manufacturers to standardize absorbency designations using the following terms:

- "junior absorbency" for tampons absorbing up to 6 grams of fluid;
- "regular absorbency" for tampons absorbing greater than 6 grams, up to 9 grams of fluid;
- "super absorbency" for tampons absorbing greater than 9 grams, up to 12 grams of fluid;
- "super plus absorbency" for tampons absorbing greater than 12 grams, up to 15 grams of fluid.

Presently there is no uniform absorbency labelling system. One manufacturer's "regular" or "super" may indicate a higher or lower absorbency than the same terms of another brand.

When these labelling changes are fully implemented, all tampons of a stated absorbency, regardless of manufacturer, will absorb the same amount of fluid, within the ranges stated above.

These same absorbency designations will also be found on packages of tampons sold in the United States.

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Toxic Shock Syndrome (TSS)

Toxic Shock Syndrome (TSS) results when a bacterially-produced toxin enters the bloodstream. TSS is a rare but serious disease, and if not treated promptly may be fatal. It is associated with tampon use, but TSS also occurs in non-menstruating women and very infrequently in men.

Tampons do not cause TSS. The bacterium involved has never been found on packaged tampons. However, it is thought that improper use of tampons may encourage the production of the toxin.

Several reports have suggested that the risk of menstruating women contracting TSS increases with the use of higher absorbency tampons. Hence women should choose tampons with the minimum absorbency necessary for their individual needs.

Standardization of absorbency designations will make this choice easier by permitting absorbency comparisons between different brands and styles of tampons.

Minimizing the Risk of Tampon-Associated TSS

Women can minimize the risk of contracting TSS by taking several precautions, including:

- choosing to use external protection rather than tampons
- choosing a tampon with the minimum absorbency necessary for individual needs;
- remembering to change tampons every 4-6 hours, and to remove the last tampon at the end of the menstrual period;
- using external protection overnight;
- maintaining a high level of personal hygiene;
- reading and following the instructions enclosed in each package of tampons.

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Symptoms and Treatment of Toxic Shock Syndrome

The initial symptoms of TSS are flu-like and include high fever (102°F,38.8°C), vomiting, diarrhea, fainting and dizziness. Additional signs might include hypotension (low blood pressure), signs of shock, dehydration and a rash which resembles a sunburn.

Tampon users should be thoroughly familiar with the symptoms of TSS. These symptoms are also described in the insert accompanying each package of tampons.

If any of the symptoms appears, tampon use should be discontinued immediately, and a physician consulted as quickly as possible. The physician should be informed that tampons were being used.

If TSS is diagnosed and treated promptly with the appropriate antibiotics, a complete recovery can generally be expected.

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Menstrual Tampons - Toxic Shock Syndrome is one of Health Protection Branch **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups interested in health protection in Canada.

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Health Protection Branch

ISSUES

DRUGS FOR THE TREATMENT OF AIDS

Introduction

Acquired Immunodeficiency Syndrome (AIDS) and human immunodeficiency virus infections (HIV) have necessitated the development of new drugs, therapies and new approaches to the testing of promising experimental drugs. A number of drugs are being studied and tested for use in preventing and treating AIDS/HIV.

Health and Welfare Canada has taken several important measures to ensure that drugs are made available to AIDS/HIV patients and to accelerate the process of drug evaluation.

There is a recognition for innovation in clinical trials designs while at the same time preserving the necessary rigour of scientific research. Information on experimental drugs needs to be provided at the earliest possible stage of treatment in order to allow the patient and physician to make an informed decision.

Health and Welfare Canada has established two important initiatives to promote the development of new drugs and to provide information on the treatment of AIDS/HIV announced in "HIV and AIDS: Canada's Blueprint -- June 1990". These are the National HIV Clinical Trials Network and the Treatment Information System for AIDS/HIV (TISAH).

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National HIV Clinical Trials Network

The Department of National Health and Welfare, set out this past year to ensure that the infrastructure required to facilitate the timely and efficient implementation of clinical trials on a national basis was put into place.

The objectives of this new initiative are:

- to create a well organized infrastructure to support the implementation of clinical trials of HIV therapeutic agents;

- to foster collaborative research on an international basis, particularly with our counterparts in the United States;

- to ensure access to trials on a national basis; and,

- to improve communication among researchers, clinicians and their patients and the pharmaceutical industry.

The Canadian HIV Trials Network began in June, 1990 with its headquarters at the University of British Columbia and St. Paul's Hospital in Vancouver. A network of five Regional Trial Units plus their satellites have been established across Canada. As of October 1, 1990, the Network accepted 6 trials for implementation. These trials will study the combined use of zidovudine and alpha-Interferon, acemannan, dideoxyinosine (ddI) versus zidovudine and clindamycin/primaquine versus trimethoprim-sulfamethoxazole.

Treatment Information System for AIDS/HIV

In June 1990, the Minister of National Health and Welfare announced the development of the Treatment Information System for AIDS/HIV (TISAH). Health professionals and persons with HIV/AIDS will be able to access information on emerging drugs and treatments through this system.

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This national system, which will provide information in both official languages, is affiliated with the University of Toronto. The development of TISAH is being managed by the Physician Behaviour Research Unit at the Department of Behavioural Science, Faculty of Medicine, University of Toronto, under the direction of Dr. Kathryn M. Taylor.

The Drug Approval Process

The Health Protection Branch (Drugs Directorate) of Health and Welfare Canada is responsible for the review of all drugs marketed in Canada before these are made available to the public. This review process ensures that the drugs are of acceptable quality and provide a significant benefit to the patients in relation to the risks involved in taking the drug.

In order to market a new drug in Canada, the manufacturer or sponsor must file a New Drug Submission (NDS) with the Health Protection Branch. If the NDS contains sufficient evidence to establish the drug's safety and effectiveness for an indicated use, and if the manufacturing process meets strict requirements, a Notice of Compliance (NOC) is issued. This notice authorizes the manufacturer or sponsor to market the drug in Canada.

Before a New Drug Submission is filed, drugs must undergo clinical trials involving humans. It is not necessary to conduct clinical trials in Canada to gain approval to market. However, if these studies are to be conducted in Canada, these studies must be filed and are reviewed by the Health Protection Branch. This is done through a Preclinical New Drug Submission (IND), which among other things provides data from previous animal experiments, outlines the protocol to be used in the trials, and describes the manufacturing process, plant, equipment, personnel, quality control measures, etc. These trials have the benefit of making experimental drugs available to patients under strictly controlled and monitored conditions.

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It is a common misconception that the Health Protection Branch demands placebo-controlled trials. Establishment of comparative efficacy necessitates the use of appropriate controls, but the control is determined by the design and proposed objectives of the clinical trial. Depending on the protocol, some seriously-ill patients may be ineligible to participate in controlled clinical trials. In such cases, a special category of protocols, often referred to as open or treatment-observational protocols, can be used to provide access to an experimental drug for patients who have life-threatening diseases.

The Drugs Directorate encourages a more rapid initiation of clinical investigation for HIV related therapies by accepting where possible the protocols submitted and approved in foreign countries provided these are of acceptable standard and include adequate safety data.

Emergency Drug Releases

The Canadian Food and Drug Regulations enable physicians to request the emergency release of an experimental drug which has not yet received clearance in Canada for marketing or clinical trials (often because a submission has not been made).

Under the provisions of the regulations a manufacturer is authorized to provide a specified quantity of the drug for a particular patient when information specified in the regulations has been provided to the Health Protection Branch and minimal conditions outlined in the regulations have been fulfilled.

Emergency drug releases are authorized when a medical emergency exists and standard therapy is not effective.

Procedures for obtaining drugs under the emergency drug regulations are described in the Compendium of Pharmaceuticals and Specialties. During office hours telephone requests are accepted for biological drugs at **(613) 957-0363** and other drugs at **(613) 993-3105**; after hours call **(613) 993-0123** for all drugs.

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EXPEDITING AIDS/HIV DRUGS

The following measures have been taken to expedite the approval of AIDS/HIV drugs and to ensure that experimental AIDS/HIV drugs are made available to patients whenever possible.

New Drug Submissions

In order to facilitate early marketing, AIDS-related New Drug Submissions will be "fast tracked" by the Health Protection Branch.

As well, the Branch has indicated that it will review manufacturing information on a new AIDS/HIV drug in advance of the filing of an NDS thereby expediting evaluation of the submission when it is received.

New Drug Submissions which lack certain key data may also be accepted by the Branch. For example, if complete information is available on some but not all of the pivotal trials conducted on a drug, the submission will be accepted and the review commenced pending receipt of data from the remaining trials. This procedure is not generally permitted for other drugs.

Finally, the Health Protection Branch is encouraging early consultations with the drug manufacturer to assist in the development of New Drug Submissions and to review any concerns or questions which may arise about a specific submission. The assessment of New Drug Submissions is also being expedited through enhanced consultation with AIDS experts within Health and Welfare Canada and from outside agencies, including review by external experts on a contract basis.

Preclinical New Drug Submissions (IND)

Under the Canadian Food and Drug Regulations, the Health Protection Branch is required to object to INDs within 60 days of receipt if deficiencies exist. Within this time frame, the Branch is giving priority to reviewing INDs for AIDS/HIV drugs. It is also developing mechanisms which will allow for the commencement of clinical trials of AIDS/HIV drugs before the 60-day period expires.

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In order to facilitate the commencement of clinical trials, manufacturing data may be reviewed in advance of the filing of INDs for AIDS/HIV drugs. Moreover, the Health Protection Branch has agreed to accept without change, protocols approved by the U.S. Food and Drug Administration for multi-centre trials sponsored by the National Institute for Allergies and Infectious Diseases of the National Institute of Health in the United States. This will expedite review of the IND and enable the pooling of data from the Canadian and U.S. studies.

Manufacturers of potentially promising drugs that have received regulatory approval in other countries are also being encouraged to file INDs in Canada. Where possible, the submitted protocols are accepted without change. The Health Protection Branch is also enhancing communications and cooperation with other countries and agencies in the field of AIDS/HIV drugs research.

Early consultation with drug manufacturers, to assist in the development of INDs, is being encouraged to stimulate and facilitate clinical research on AIDS/HIV drugs in Canada.

Emergency Drug Releases

When appropriate, physicians who request an emergency release of an experimental AIDS/HIV drug are encouraged to have their patient included in a clinical trial of the drug. This approach benefits both the patient and the trial, and may lead to early marketing of the drug involved.

In cases where the patient is ineligible for a clinical trial, the Health Protection Branch is dealing promptly with requests for emergency drug releases. Every effort is made to ensure that drugs are released for use by a specified patient, providing the doctor establishes compelling medical need. Ultimately, however, availability of the drug from a supplier may be the limiting factor.

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THE STATUS OF AIDS/HIV DRUGS

The Health Protection Branch is committed to expediting the development of AIDS/HIV drugs and to making experimental AIDS/HIV drugs available to Canadians where justified by medical evidence. The status of drugs used in the treatment of AIDS/HIV and related diseases is as follows:

Anti-AIDS Drugs

Drug: **alpha-Interferon (oral)**
Brand Name: ----------
Manufacturer: Hayashibara Biochemicals Inc. Okayama, Japan

Status: An IND is being developed. This product is available under the Emergency Drug Release Program for treatment of AIDS/HIV related symptoms.

Drug: **Dextran Sulphate**
Brand Name: USHERDEX
Manufacturer: Dextran Products Ltd.

Status: An IND is currently under development by the manufacturer. In the interim period, Dextran Sulphate is available through the Emergency Drug Release Program.

Drug: **Dideoxycytidine (ddC)**
Brand name: HIVCID
Manufacturer: Hoffman-La Roche Ltd.

Status: An IND is being developed for an open clinical trial that will include patients, 12 years and older. Currently being reviewed is the question of various nucleoside analogue failures and/or intolerance. The drug is available through the Emergency Drug Release Program.

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Drug: **Dideoxyinosine (ddI)**
Brand name: VIDEX
Manufacturer: Bristol-Myers Squibb Co.

Status: Dideoxyinosine is currently available through an open protocol administered by five regional centres across Canada. HIV infected patients, 12 years and older, who are intolerant or resistant to zidovudine and whose CD_4^+ cell count is below 200 cells per cubic millimeter are eligible to receive ddI.

Current clinical research on ddI in Canada includes a double-blind trial comparing HIV-infected patients with a CD_4^+ cell count between 200 and 500 cells per cubic millimeter and who have been previously treated with zidovudine for not less than 6 months at a dose not less than 500 mg/day.

Drug: **EL10 (DHEA)**
Brand Name: -------
Manufacturer: Elan Pharmaceuticals

Status: The Health Protection Branch has no objection to the IND submitted involving two clinical studies with EL10. Formal clinical trials have not as yet been initiated in Canada.

Drug: **Ribavirin**
Brand Name: VIRAZOLE
Manufacturer: ICN Canada Ltd.

Status: Ribavirin is marketed in Canada as an aerosol treatment for infants with respiratory syncytial viral infections. An open clinical trial for the management of HIV disease is being conducted with the oral dosage form in Canada. The oral drug is also available under the Emergency Drug Release Program.

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Drug: **Zidovudine** (AZT - Azidothymidine)
Brand Name: RETROVIR
Manufacturer: Burroughs-Wellcome Inc.

Status: Zidovudine was issued a Notice of Compliance on October 16, 1990 for the management of asymptomatic/symptomatic adult patients with HIV infection who have evidence of impaired immunity (as defined by a CD_4^+ T-cell count of approximately 500 cells per cubic millimetre or less) before therapy is begun. Zidovudine is also indicated for children over three months of age who have advanced symptomatic HIV disease (pediatric AIDS or advanced AIDS Related Complex, ARC). It may also be of benefit to children who are asymptomatic with abnormal laboratory values indicating significant HIV-related immunosuppression.

Drugs to Treat AIDS-related Conditions

Drug: **alpha-Interferon**
Brand Name: ROFERON - A
Manufacturer: Hoffman-LaRoche Ltd.

Status: Roferon-A was issued a Notice of Compliance for the treatment of Kaposi's Sarcoma in AIDS/HIV patients.

Drug: **alpha-Interferon**
Brand Name: WELLFERON
Manufacturer: Pacific Pharmaceuticals

Status: Alpha-Interferon is available in clinical trials for the treatment of Kaposi's Sarcoma in AIDS/HIV patients.

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Drug: **alpha-Interferon**
Brand name: INTRON-A
Manufacturer: Schering Canada Inc.

Status: Alpha-Interferon is marketed in Canada for the treatment of Kaposi's Sarcoma in AIDS/HIV patients. An IND is under review for the combined use of two low dose regimens of alpha-Interferon with Zidovudine as treatment for AIDS-related Kaposi's Sarcoma.

Drug: **Ansamycin**
Brand Name: RIFABUTIN
Manufacturer: Adria Laboratories of Canada Ltd.

Status: An IND indicating use for the prevention of Mycobacterium avium complex bacteraemia in HIV-infected patients with CD_4^+ values $\leq$200 cells per cubic millimetre is under review.

Drug: **beta-Interferon**
Brand Name: BETASERON
Manufacturer: Triton Biosciences

Status: Beta-Interferon is available in clinical trials for the treatment of Kaposi's Sarcoma in AIDS/HIV patients.

Drug: **Clindamycin/Primaquine**
Brand Name: DALACIN C/PRIMAQUINE
Manufacturers: UpJohn Company of Canada / Winthrop Laboratories

Status: The Health Protection Branch has no objection to the IND submitted for a trial of clindamycin and primaquine (in combination) for the treatment of acute Pneumocystis carinii pneumonia (PCP). Both drugs are marketed for the treatment of other illnesses.

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Drug: **Clofazimine**
Brand name: LAMPRENE
Manufacturer: Ciba-Geigy Canada Ltd.

Status: Clofazimine has been used for leprosy and tuberculosis associated with AIDS/HIV. It is available under the Emergency Drug Release Program.

Drug: **Eflornithine**
Brand Name: ORNIDYL
Manufacturer: Merrell-Dow Pharmaceuticals (Canada) Ltd.

Status: An IND for an open clinical trial of eflornithine in the treatment of acute Pneumocystis carinii pneumonia (PCP) is under development. The drug is available under the Emergency Drug Release Program.

Drug: **Fluconazole**
Brand Name: DIFLUCAN
Manufacturer: Pfizer Canada Inc.

Status: Fluconazole was issued a Notice of Compliance on August 27, 1990 for the treatment of oropharyngeal and oesophageal candidiasis and cryptococcal meningitis. It is also indicated for the prevention of the recurrence of cryptococcal meningitis in patients with AIDS/HIV infection.

Drug: **Foscarnet**
Brand Name: FOSCAVIR
Manufacturer: Astra Pharmaceuticals Canada Ltd.

Status: Foscarnet is available in open clinical trials with broad inclusion criteria for the treatment of cytomegalovirus (CMV) retinitis.

Drug: **Ganciclovir**
Brand Name: CYTOVENE
Manufacturer: Syntex Inc.

Status: Ganciclovir was issued a Notice of Compliance for the treatment of cytomegalovirus (CMV) retinitis.

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Drug:	**Granulocyte-macrophage colony-stimulating factor (GM-CSF)**
Brand name:	SCH 39300
Manufacturer:	Schering
Status:	The Health Protection Branch has no objection to the IND submitted for the treatment of neutropenia associated with the use of marrow toxic anti-infective agents in AIDS/HIV patients. This product is available under the Emergency Drug Release Program.
Drug:	**Granulocyte-macrophage colony-stimulating factor (GM-CSF)**
Brand name:	LEUCOMAX
Manufacturer:	Sandoz Inc.
Status:	The Health Protection Branch has no objection to the INDs submitted for two trials with GM-CSF for the treatment of leucopenia caused by antiviral agents. Studies with Ganciclovir plus GM-CSF and one with Zidovudine plus GM-CSF, are being undertaken.
Drug:	**Granulocyte-macrophage colony-stimulating factor (GM-CSF)**
Brand name:	rhu GM-CSF
Manufacturer:	Hoechst Canada Inc.
Status:	An IND has been filed and a study is ongoing for the treatment of neutropenia associated with the use of marrow toxic anti-infective agents in AIDS/HIV patients. This product is available under the Emergency Drug Release Program.
Drug:	**Itraconazole**
Brand name:	SPORANOX
Manufacturer:	Janssen Pharmaceutica Inc.
Status:	The Health Protection Branch has no objection to the IND submitted for itraconazole for the comparative treatment of oropharyngeal and/or oesophageal candidiasis in HIV infected patients. Both capsule and oral solution are available through the Emergency Drug Release Program.

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Drug: **Nystatin**
Brand name: MYCOSTATIN (Lozenges)
Manufacturer: Squibb Canada Inc.

Status: Mycostatin Lozenges was issued a Notice of Compliance for the treatment of oral candidiasis. No trials have been approved specifically for candidiasis in HIV infected individuals with this dosage or formulation.

Drug: **Ozonated blood therapy** (intramuscular)
Brand name: OZON-O-MED
Manufacturer: Muller Medical International Inc.

Status: An IND was reviewed and a small pilot study has been completed.

Drug: **Pentamidine (Inhalation)**
Brand name: PNEUMOPENT
Manufacturer: Fisons Corp. Ltd.

Status: Pneumopent was issued a Notice of Compliance on June 6, 1990, for the prevention of Pneumocystis carinii pneumonia (PCP) in AIDS/HIV infected individuals who have recovered from at least one previous episode of PCP.

Drug: **Pentamidine (intravenous, inhalation)**
Brand Name: PENTACARINAT
Manufacturer: Rhone-Pôulenc Pharma

Status: Intravenous Pentacarinat is marketed in Canada for the treatment of acute Pneumocystis carinii pneumonia (PCP). A Supplemental New Drug Submission is under review for the use of aerosolized administration by inhalation in both primary and secondary prophylaxis of PCP.

Drug: **Polyerga**
Brand name: --------
Manufacturer: Globex Biotechnologies Inc.

Status: An IND is under review for Polyerga a biological response modifier.

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Drug: **Recombinant Human Erythropoietin (r-HuEPO)**
Brand Name: EPREX (STERILE SOLUTION)
Manufacturer: Ortho Pharmaceuticals Canada Ltd.

Status: Eprex Sterile Solution (r-HuEPO) was issued a Notice of Compliance on September 13, 1990 for the treatment of transfusion dependent anaemia related to therapy with AZT in AIDS/HIV infected patients with endogenous erythropoietin levels $\leq$500mU/ml.

Drug: **Spiramycin** (Intravenous)
Brand name: ROVAMYCINE
Manufacturer: Rhone-Pôulenc Pharma Inc.

Status: Intravenous spiramycin is currently under investigation in the United States for the treatment of AIDS-related cryptosporidial diarrhea. It is available in Canada under the Emergency Drug Release Program.

Drug: **SCH-39304**
Brand name: ---------
Manufacturer: Schering Canada Inc.

Status: The Health Protection Branch has no objection to the IND submitted for an open label trial of SCH-39304 for the treatment of acute cryptococcal meningitis in AIDS/HIV infected patients, followed by maintenance therapy in patients who have failed conventional therapy. This oral imidazole compound is available through the Emergency Drug Release Program.

Drug: **Trimetrexate**
Brand Name: ----------
Manufacturer: Warner Lambert Canada

Status: Trimetrexate is being investigated for intravenous use in the treatment of Pneumocystis carinii pneumonia (PCP) in patients with AIDS/HIV. Supplies may be made available through the Emergency Drug Release Program.

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AIDS/HIV Vaccines

Drug:	**Human T-Lymphotropic Virus Type III gp160 Antigen, Recombinant Vaccine, Alum Adsorbed**
Brand Name:	VAXSYN HIV-1
Manufacturer:	MicroGeneSys
Status:	The Health Protection Branch has no objection to the IND submitted and a study is ongoing in HIV infected patients.

November 30, 1990

Drugs for the Treatment of AIDS is one of Health Protection Branch Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups interested in health protection in Canada.

This Issues replaces **Drugs for the treatment of AIDS**, dated February 8, 1989.

Health Protection Branch

Issues

MISLEADING ADVERTISEMENT OF HOME-USE MEDICAL DEVICES

Introduction

Each year, Canadians spend millions of dollars on home- use medical devices that they believe will restore them to good health and well-being.

Unfortunately, some devices sold for home-use are frequently promoted as miracle cures, with claims that are not scientifically verifiable. While the majority of these devices do not pose a direct hazard to the user, they can pose an indirect hazard if they cause a patient to delay seeking proper medical treatment. There can also be a direct economic loss to the user which can sometimes amount to several thousands of dollars.

Regulations Governing the Sale of Medical Devices

All medical devices sold in Canada must comply with the provisions of the Medical Devices Regulations, Food and Drugs Act.

These Regulations are administered by the Health Protection Branch of the Department of National Health and Welfare, and establish standards and conditions of sale with which the manufacturer must comply. Manufacturers must formally notify the Branch of each device they sell within 10 days of first sale, and must supply information concerning device identification and labelling. The manufacturer must also have evidence on file to substantiate the claimed benefits of the device, and is responsible for maintaining records of user complaints.

The Health Protection Branch promotes voluntary compliance by the medical device industry with the Food and Drugs Act and Medical Device Regulations, and maintains monitoring programs to ensure the safety and effectiveness of new and existing devices. However, in cases of non-compliance, the Health Protection Branch has the responsibility to initiate investigations, and to undertake appropriate action, should a device be potentially harmful to human health.

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In addition to administering and enforcing the Medical Device Regulations, the Branch provides information on medical devices to the general public, health professionals, and the medical devices industry through publications such as Health Protection Branch Issues, Surveillance, Information Letters, and Medical Devices Alerts.

The Health Protection Branch notification database contains information on almost 490,000 medical devices. Another 25,000 new devices appear on the Canadian market each year.

Given the enormous number and vast array of devices on the market, priority for regulatory action must be given to situations involving health risks. When there is no direct health risk, misrepresentation of the benefits of some home-use medical devices is eventually addressed, but it may remain a problem for some time.

Public education, then, becomes the most effective way to increase awareness of the problem, and to assist the consumer to make informed choices about home-use medical devices.

Examples of Misrepresented Devices

There are a number of questionable medical device/cures currently on the market. The following are examples of devices claimed to be beneficial to health, even though there is no scientific or medical evidence to support such claims.

Cosmetic Lasers

The medical application of lasers has become increasingly popular in recent years. Medical lasers are used for surgical cutting and coagulation, and achieve their results by heating tissues to high temperatures, burning or vaporizing it.

However, some manufacturers promote lasers for cosmetic effects, such as removing wrinkles or "rejuvenating" the skin. These lasers emit light of a very low intensity, and are unlikely to have any effect on the skin, although they could possibly harm the eye, if used without eye protectors.

Ozone Generators

Some home-use devices claim to generate beneficial ozone (sometimes also called "activated oxygen") to rejuvenate the skin or restore vitality. There are no legitimate medical benefits from exposure to ozone. It is illegal to sell or advertise a medical device which deliberately exposes humans to any amount of ozone.

Ion Generators

These devices, also called air ecologizers, were popular about ten years ago but have recently faded from public attention.

They claimed benefits from the generation of negatively charged air ions. Some were marginally useful in removing smoke and dust from the air because they created electrostatic fields. The benefits of air ions have never been scientifically or medically confirmed. These devices are harmless as long as they don't generate ozone.

Pulsed Electromagnetic Field Devices

Most notable among the questionable devices are pulsed electromagnetic field devices. There has been a dramatic increase in their number and variety over the past 20 years.

Reputable scientific literature has substantiated the effectiveness of electromagnetic waves in promoting bone regrowth of non-healing bone fractures, and there is good evidence for its application in wound-healing and osteoporosis. Most importantly, these observations have been validated by scientific studies and extensive clinical investigations by qualified health care professionals, and have been reported in the appropriate medical literature.

Unfortunately, some devices claiming to use similar technology are also being promoted as effective treatment for almost every other type of ailment, including hypertension, diabetes, arthritis, problems of the liver and kidneys, chronic pain, AIDS, and even various forms of cancer. In fact, because there is no verifiable scientific or medical evidence, these claims are considered to be a misrepresentation of the benefits of the device, and are prohibited under the Food and Drugs Act.

What You, the Consumer, Can Do

Before purchasing any medical device for home-use:

1) *Consult your family physician or other health care professional.* This will ensure that medical problems are treated promptly and properly, and not allowed to deteriorate to an untreatable state. By obtaining professional medical advice you may also save a considerable amount of money and avoid the potential disappointment of being misled.

2) *Read the product label carefully, be well aware of the claims and the expected results.*

3) *Beware of home-use devices that claim to treat a wide variety and range of ailments* with cures that are quick, painless, simple and miraculous.

4) *Beware of personal testimonials.* In the majority of cases, testimonials have not been substantiated by scientific or medical evidence, and should not be accepted as valid evidence of a product's effectiveness.

In Short

Before purchasing a home-use medical device, **consult your doctor**. Be wary of the **aggressive, miracle cure-type advertising**, and most importantly, remember, **if it sounds too good to be true, it most likely is!**

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July 5, 1991

Misleading Advertisement of Home-use Medical Devices is one of Health Protection Branch **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the media and special interest groups interested in health protection in Canada.

Aussi disponible en français

Health Protection Branch

Issues

WATER TREATMENT DEVICES - for the Removal of Taste, Odour and Chemicals

Introduction

Canadians are becoming increasingly aware of environmental pollution and the limitations of water treatment processes. Because safe drinking water is essential to human health, the chemical quality and biological safety of our drinking water are of great importance.

Although the presence of chemicals in our drinking water often creates concern about pollution and disease, chemically pure water does not in fact exist in nature. Water, which is known as the universal solvent, *always* contains a variety of chemicals and minerals. Moreover, Canadian drinking water supplies are largely free of the disease-causing organisms found in water supplies of many developing countries.

Even so, water treatment devices have become common household appliances in recent years. It is estimated that as many as 100 000 units are sold annually in Canada. These water treatment systems tend to be regarded as something between a device that will protect health from a perceived risk and an everyday kitchen appliance that can improve the appearance, taste and smell of our drinking water.

Types of Devices

Water treatment devices can be divided into two groups, according to function. Those that improve the overall taste, smell and appearance of the water or remove undesirable chemicals and minerals will be discussed here. Those that disinfect contaminated water are discussed in the Health Protection Branch *Issues* paper - *Water Treatment Devices - For Microbiological Purification.*

Point-of-use devices are treatment systems installed on single or multiple taps and are intended to treat water for drinking and cooking only. *Point-of-entry* devices are installed on the main water supply and treat all the water entering the home.

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Several types of devices are used to improve the aesthetic qualities of drinking water and to remove chemicals. Those that employ an activated carbon filter are the most common, and are usually installed at the point of use. Activated carbon filters are generally more effective in removing organic chemicals. They are often used to improve taste, smell and appearance and are frequently combined with other treatment processes to provide a more complete water treatment system.

A number of other point-of-use devices are employed primarily for removing undesirable chemicals from drinking water. There processes include reverse osmosis, ion exchange, and distillation.

A *reverse osmosis* treatment system usually consists of a semi-permeable membrane, water storage tank and dispensing faucet. This system can remove inorganic chemicals and is often combined with an activated carbon filter to remove chlorine and organic chemicals.

Various pitcher-type products are also available. In addition to having activated carbon filters, these devices may include an *ion-exchange* resin for the removal of inorganic chemicals responsible for "hard" water.

Distillation systems are commonly used to reduce the chemical levels in drinking water. These systems boil water in one compartment and condense the vapour and collect it in another. Distillation systems are effective for the removal of both organic and inorganic chemicals but are often combined with activated carbon for the removal of certain "volatile" chemicals (e.g. Trihalomethanes, tetrachloroethylene). There are no known beneficial, nor harmful health effects associated with the ingestion of demineralized or distilled water.

Two widely used *point-of-entry* water treatment devices are *water softeners* and *greensand filters*. These are commonly used to soften well water in rural areas. Water softeners will only reduce water hardness and will not remove organic chemicals. Greensand filters are designed primarily to remove iron, manganese and hydrogen sulfide from water.

Potential Health Problems Associated with the Use of Water Treatment Devices

The activated carbon filters used in many water treatment devices can, in themselves, become a source of contamination. Over time, the filter can become saturated with chemical contaminants, resulting in the release of these compounds into the finished water, possibly in even higher concentrations than in the source water. As well, build up of organic matter on the filter can lead to bacterial growth over even short periods of time, i.e., overnight. Some manufacturers have devised various methods of reducing the microbial growth, such as adding silver, but the effectiveness of these methods is questionable.

Although softened water is more suitable for washing and helps prevent deposits in appliances and pipes, it is not generally recommended for drinking and cooking due to its increased sodium content, decreased essential mineral content and the potential for bacterial growth. *Note: bacterial growth may also occur in greensand filters.* A variety of salt-free water softeners and conditioners have appeared on the market. Although the use of these devices does not appear to present a health hazard, there is some controversy over their effectiveness.

What the Consumer Can Do

The health risks associated with using a water treatment device which employs an activated carbon filter can be reduced by following these steps:

1. use only on municipally-treated or other water supplies known to be free of microbial contaminants);

2. flush for at least 30 seconds before each use;

3. change filters or units (if unit is disposable) frequently;

4. carefully follow the manufacturer's instructions for installation and service.

Water not consumed immediately after point-of-use treatment should always be stored in the refrigerator to avoid microbial contamination.

Conclusions

Although there is currently no specific legislation governing water treatment devices, Health and Welfare Canada considers it essential that water processed through a water treatment device meets the quality set in the *Guidelines for Canadian Drinking Water Quality* (Health and Welfare Canada, 4th Edition, 1989). It is worthwhile to note that water already satisfying the criteria in the guidelines does not normally require additional treatment in the home, at least for health-related reasons.

Health and Welfare Canada insists that activated carbon filters and related packaging, promotional and instructional materials be clearly labelled *"Use only on municipally treated water or other supply known to be microbiologically safe"*. This agrees with the voluntary guidelines developed by the Canadian Water Quality Association for the advertising and promotion of activated carbon filters.

In addition, Health and Welfare Canada has worked closely with the National Sanitation Foundation to develop performance standards for water treatment devices. The Department encourages manufacturers to seek certification of their products against the National Sanitation Foundation standards. These standards and the National Sanitation Foundation listing are now widely accepted in North America as evidence of specific performance, by brand and model, for removal of specific contaminants, as well as mechanical integrity of the devices.

Ultimately, compliance with these voluntary performance standards should make the selection of an appropriate device much easier for the Canadian consumer.

As outlined in *Canada's Green Plan for a Health Environment*, the federal government plans to introduce a Drinking Water Safety Act in 1991. One component of this Act will be the development of quality criteria for point-of-use water treatment devices.

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Water Treatment Devices - For the Removal of Taste, Odour and Chemicals is one of a series of Health Protection Branch Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups interested in health protection in Canada.

Aussi disponible en français.

Health Protection Branch

Issues

WATER TREATMENT DEVICES

(For Microbiological Purification of Water)

Introduction

Public awareness of potential ground water contamination and the growing interest in recreational activities in areas not serviced with safe drinking water have led to increased usage of water purification devices.

In Canada, over four million people depend on private wells for their drinking water. As well, lakes, rivers and other sources of water often serve as the sole water supply for cottagers and campers. Unlike municipal water systems, these water supplies may not be subjected to routine testing for microbiological contamination, or to appropriate disinfection procedures.

Private wells can become contaminated because of improper well construction or location. In fact, the aquifer itself (water-bearing underground layer of porous rock or sand) can even be the source of contamination. Surface waters are susceptible to contamination from raw or improperly-treated sewage, wild animals, and even house pets.

Microbiological contamination is the primary cause of disease outbreaks from drinking water. Between 1974 and 1984, 51 water borne outbreaks involving 3799 people were reported.

Water taken from lakes, rivers, streams and ponds may look clean and have no undesirable odour. Unfortunately, however, pathogens found in water are not only harmful, they are invisible to the naked eye. These bacteria, viruses and protozoan cysts can cause mild nausea and fever, or develop into severe diarrhea, hepatitis, or typhoid fever. Lake or river water, or water from streams and ponds **should always be purified** before being used.

Disinfection of Water

Depending on the source, magnitude and extent of microbiological contamination, disinfection may be needed occasionally over short periods of time, or on a continuous basis.

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For occasional or short-term disinfection, there are several simple methods that do not require special devices:

- boiling water for one minute will kill most common pathogens, but boiling for at least five minutes will ensure complete disinfection;
- household bleach, which contains four to five percent sodium hypochlorite, will disinfect water when at least five drops are added to four litres of water and left to stand for 30 minutes and
- water purification tablets that release chlorine or iodine are especially useful for travellers - when used according to manufacturers' directions.

When water must be continuously disinfected because of the unacceptable quality of the supply or the possibility of sporadic contamination, a water treatment device may be more practical than short-term disinfection methods.

Water Treatment Devices

Point-of-use devices are treatment systems installed on single or multiple taps, and are intended to treat water for drinking and cooking only. Point-of-entry devices are installed on the main water supply, and treat all the water entering the home.

These devices can be divided into two groups - those that **disinfect microbiologically-contaminated water** (which we will deal with in this Issues paper), and those that improve the overall taste, smell and appearance of the water or remove undesirable chemicals and minerals (see **Health Protection Branch Issues** - Water Treatment Devices - (For the Removal of Taste, Odour and Chemicals). There are several types of devices within these two groups, each suited to a specific water quality problem.

Chlorinators and **ultraviolet light** devices are the most practical when it is necessary to disinfect water that serves a whole house. Chlorine generally kills disease-causing organisms, and requires short-to-moderate contact time. In fact, the use of chlorine on municipally treated water systems has virtually eliminated water-borne microbial diseases such as typhoid and cholera, due to chlorine's ability to kill or inactivate essentially all enteric pathogenic micro-organisms. Chlorination is also suitable for the removal of iron and sulphur from well water.

Ultraviolet (U.V.) devices are also effective against most pathogens, add nothing to water, produce no taste or odour, and in clean water require only a few seconds' exposure. They do not, however, ensure safety of the water beyond the point of application, so that flushing of the system is recommended after periods of non-use. Since protozoan cysts are particularly resistant to U.V. light and may protect other micro-organisms, a prefiltration system should be employed to remove cysts.

Ceramic candles and iodinators handle smaller amounts of water and are useful when the water from just one tap is to be treated for drinking and cooking. While ceramic candles are effective on mildly-contaminated waters, they may not be suitable for removing water-borne viruses and for treating highly contaminated water. For outdoor use, portable ceramic candles are also available.

Iodinators are relatively simple devices that disinfect water by releasing an iodine solution into the main water stream. However, iodine disinfection of drinking water should be reserved for emergency and occasional use (e.g., at a weekend cottage or in recreational vehicles). Iodine should not be used for long-term continuous disinfection because it is physiologically active, and ingestion in excessive amounts may be harmful. Portable units containing an iodine-releasing resin are also available. Protozoan cysts are often present in surface waters. Because it is not as effective against these cysts, iodine requires a reaction period to ensure adequate destruction. (For example, water being treated with iodine tablets should be left for at least a half-hour to ensure that the water is disinfected.)

Distillation and **ozonation** are point-of-use systems suitable where electric power is available, and where there is sufficient space to install the equipment. In distillation, water is boiled and the vapour condensed and collected. This process removes inorganic contaminants, including heavy metals, but it may not remove all organic materials.

Ozonators produce small quantities of ozone, a strong oxidizing gas that is effective in killing pathogens over a short period of time. Ozonation produces no taste or odour. The process is dependent, however, on good mixing of ozone with the water, and the residual effect is very short-lived. Both distillation and ozonation may be combined with carbon filtration to achieve more complete water treatment.

As most disinfection systems require clear water to ensure maximum efficiency, it may be necessary to combine two specific systems - one to remove various organic or inorganic compounds or to reduce turbidity in the water, and one to treat the microbiological contamination.

Conclusions

When camping or hiking, it should be assumed that all waters are microbiologically contaminated, and the water should be treated accordingly. Care must also be taken to avoid ingestion of untreated water from other taps (for instance, when brushing your teeth).

Wells should be analyzed routinely for microbiological contamination. According to the Guidelines for Canadian Drinking Water Quality (Health and Welfare Canada, 4th Edition, 1989), no sample should contain more than 10 total coliform bacteria per 100 ml of sample, and none should be fecal coliforms. If well water does not comply with this guideline, it should be disinfected using one of the methods described above.

Although there is currently no specific legislation governing water treatment devices, the federal government is planning to introduce a Drinking Water Safety Act in 1991. As outlined in **Canada's Green Plan**, one component of this Act will be the development of quality criteria for water treatment devices, including disinfection units.

Ultimately, the best approach to ensure complete purification of water intended for human use and consumption is a multibarrier system, consisting of filtration and disinfection.

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15 August, 1991

Water Treatment Devices - For Microbiological Purification of Water is one of a series of Health Protection Branch Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

Aussi disponible en français.

Health Protection Branch

ISSUES

RAW MILK - AN UNNECESSARY RISK

Pasteurized milk has been seen as a blessing by most milk consumers since its introduction. As of the early 1900s, there have been major decreases in the incidence of a number of food borne diseases related to milk consumption because of pasteurization.

Despite these advantages a small number of consumers continue to prefer raw milk. Evidence has shown that Canadians are still contracting disease through consumption of unpasteurized milk. Several different kinds of pathogenic bacteria such as Salmonella, Brucella, Pseudomonas, Yersinia, Campylobacter have been reported to have caused food poisoning following the consumption of raw milk. Today the most serious threat may come from Listeria monocytogenes, which is a newly emerging infectious and disease causing bacterium. This pathogen may cause blood poisoning and meningitis in persons who have weakened immune systems or as in children whose immune system is not fully developed. It may also result in abortion, stillbirth, or miscarriage if pregnant women become infected. It has been found that between one and ten per cent of the raw milk supply may be contaminated by that bacterium. Preliminary studies seem to indicate that Listeria monocytogenes grows better in dairy products than in other kinds of foods.

Because of these health concerns, Health and Welfare Canada is proposing a prohibition on the sale of raw or unpasteurized milk to consumers. The amendment to the Food and Drug Regulations will provide a national regulatory safeguard against potentially serious milk-borne illness. This proposal is expected to take effect in the fall of 1991.

The Department believes that this measure is important to protect public health and has consulted extensively with all interested parties. Milk is an important food and contains many nutrients essential for good health. Since raw milk does not provide any nutritional advantage over pasteurized milk, it is not worth taking the risk of contracting a serious food-borne disease for the sake of consuming the raw product.

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Raw Milk - An Uncessary Risk is one of a series of Health Protection Branch **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

Aussi disponible en français.

Direction générale de la Protection de la Santé

Actualités

LA SANTÉ HUMAINE ET LA LOI CANADIENNE SUR LA PROTECTION DE L'ENVIRONNEMENT

Introduction

Au Canada, plus de 20 000 produits chimiques différents sont utilisés dans les procédés industriels ou entrent dans la composition des produits de consommation. Si bon nombre de ces produits chimiques contribuent à l'amélioration de notre qualité de vie, il arrive cependant qu'ils représentent une menace à la fois pour notre santé et pour l'environnement.

La *Loi canadienne sur la protection de l'environnement (LCPE)* témoigne de la volonté du gouvernement fédéral de réduire la quantité de contaminants toxiques dans l'environnement. L'application de cette loi fédérale relève à la fois d'Environnement Canada et de Santé et Bien-être social Canada. Les efforts en vue de protéger les Canadiens de la pollution causée par les substances toxiques s'inscrivent dans le cadre de la LCPE. Cette loi vise à faire en sorte que les risques éventuels posés par les substances chimiques et par les produits de la biotechnologie soient soigneusement évalués. En outre, cette loi prévoit un contrôle rigoureux des substances jugées toxiques et des sanctions sévères pour les pollueurs. La LCPE s'applique à tous les produits qui ne sont pas visés par d'autres lois, telles que la *Loi sur les aliments et drogues* et la *Loi sur les produits antiparasotaires.*

Protection contre la pollution et les substances toxiques

Aux termes de la Loi, est **toxique** toute substance qui se retrouve dans l'environnement en quantité suffisante pour :

- avoir un effet nocif sur l'environnement (par exemple, les BPC peuvent s'accumuler dans le poisson et occasionner des problèmes de reproduction chez les animaux sauvages qui en consomment);
- mettre en danger l'environnement (par exemple, les CFC endommagent la couche d'ozone et accroissent l'exposition aux rayons ultraviolets et, par conséquent, les risques de cancer de la peau);

- constituer un danger pour la vie ou la santé humaine (par exemple, le plomb peut nuire au développement du système nerveux humain).

La toxicité d'une substance dépend de ses propriétés toxiques et de la quantité à laquelle la population est exposée. On détermine l'ampleur de l'exposition en examinant la concentration de cette substance dans les aliments, l'eau potable, l'air et les produits de consommation. À la lumière de ces études, on peut, par exemple, déterminer le potentiel cancérigène de la substance en question.

Substances d'intérêt prioritaire

Dans le cadre de la LCPE, on accorde une attention particulière à l'évaluation des substances qui sont déjà d'utilisation courante. Le programme d'évaluation repose avant tout sur la Liste des substances d'intérêt prioritaire (LSIP). Dans un premier temps, on a consigné sur cette liste 44 substances devant faire l'objet d'une évaluation prioritaire en vue de déterminer le danger qu'elles représentent pour la santé humaine ou pour l'environnement. Dans les rapports d'évaluation, on retrouvera les caractéristiques de la substance : comment elle pénètre dans l'environnement, ses effets sur la santé et sur l'environnement, ainsi que le risque que représente son utilisation. Si une substance est jugée toxique, on surveillera son utilisation en ayant recours, par exemple, à des lignes directrices, à des codes de bonnes pratiques ou à des règlements. En vertu de la *Loi canadienne sur la protection de l'environnement*, on doit surveiller les substances toxiques durant tout leur cycle de vie, c'est-à-dire depuis leur mise au point jusqu'à leur élimination.

Conformément au **Plan vert du Canada**, on donnera plus d'ampleur à ce programme d'évaluation de façon qu'il englobe 100 substances d'intérêt prioritaire d'ici l'an 2000.

Nouveaux produits chimiques

Les produits chimiques qui sont déjà d'utilisation courante au Canada figurent sur la Liste intérieure des substances (LIS). Est **nouvelle** toute substance qui ne figure pas sur cette liste. En ce qui a trait aux produits chimiques nouveaux, le gouvernement fédéral adopte une attitude préventive et exige de l'industrie qu'elle fournisse des données sur ces derniers **avant** qu'ils ne soient mis sur le marché.

Environnement Canada et Santé et Bien-être Social évaluent le danger que représentent les substances nouvelles pour la santé humaine ou pour l'environnement. Les autorités décident ensuite s'il y a lieu d'autoriser la fabrication ou l'importation de ces substances au Canada et quels sont les contrôles requis.

Produits de la biotechnologie

Les techniques modernes de génie génétique entraînent un accroissement rapide de la gamme et de la portée des applications de la biotechnologie. Ces techniques sont utilisées dans les domaines de l'agriculture, des mines, de la chimie, de la production énergétique et de l'élimination des déchets. Certaines applications nécessitent la production de grandes quantités de micro-organismes ou l'introduction de micro-organismes dans l'environnement.

En vertu de la LCPE, les nouveaux produits de la biotechnologie doivent faire l'objet d'une évaluation **avant** leur fabrication ou leur importation. Cette évaluation comporte une identification de l'organisme en question et une description de ses caractéristiques. En outre, il faut procéder à des essais particuliers afin de s'assurer que cet organisme n'a pas un effet nocif sur la santé humaine. Santé et Bien-être social Canada évalue soigneusement les renseignements obtenus - tout comme il le fait pour les produits chimiques nouveaux - et détermine quels sont les contrôles requis.

Réglementation et surveillance connexes

La réglementation qui régissait, autrefois, les substances toxiques au Canada fait maintenant partie intégrante de la *Loi canadienne sur la protection de l'environnement.*

Notre pays a en outre signé diverses ententes internationales en vertu desquelles la surveillance de certaines substances toxiques (qui ne figurent pas sur la LSIP) est obligatoire. Au nombre de ces substances, mentionnons l'anhydride sulfureux, les oxydes d'azote, les chlorofluorocarbures et les halons.

Mise en application de la LCPE

Le gouvernement fédéral procède à des inspections et à des enquêtes régulières afin de s'assurer que la réglementation régissant la manipulation sécuritaire, l'utilisation et l'élimination des substances toxiques est respectée. Environnement Canada est chargé de l'application de cette réglementation et peut imposer des sanctions sévères - des amendes pouvant atteindre 1 000 000 $ par jour et jusqu'à cinq ans d'emprisonnement - aux personnes ou aux organisations qui l'enfreignent.

On peut en outre exiger des pollueurs qu'ils paient eux-mêmes les coûts de la dépollution ou se départissent de tous les profits imputables à leurs pratiques polluantes. Enfin, et c'est une première, les dirigeants d'entreprise seront poursuivis s'ils autorisent toute violation des règlements de la LCPE ou y participent.

Programme de choix environnemental

On ne saurait toutefois compter uniquement sur la réglementation fédérale pour assurer la surveillance efficace des substances toxiques. Il faudra en effet que tous les Canadiens - gouvernements, industries et particuliers - soient mis à contribution. Le Programme fédéral de choix environnemental, mis sur pied par Environnement Canada, vise à aider les consommateurs soucieux de leur environnement à passer à l'action. Dans le cadre de ce programme, on a créé un logo particulier qui permet de reconnaître les produits inoffensifs pour l'environnement.

Une responsabilité constante

Lorsqu'il s'agit de protéger la santé humaine et l'environnement, le rôle du gouvernement ne se limite pas à la publication d'un rapport d'évaluation ou à l'évaluation et à la surveillance initiale d'une substance nouvelle. Dès que l'on obtient de nouveaux renseignements sur une substance toxique, celle-ci est réévaluée. Grâce à cet exercice de réévaluation, les Canadiens jouissent toujours d'une qualité exceptionnelle de la vie.

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Le 20 septembre, 1991

La santé humaine et la Loi canadienne sur la protection de l'environnement fait partie de la série **Actualités**, une publication produite par la Direction générale de la protection de la santé de Santé et Bien-être social Canada à l'intention du public, des médias et des groupes qui s'intéressent à la santé au Canada.

Also available in English

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Issues

REYE'S SYNDROME

What is Reye's Syndrome?

Reye's Syndrome (RS) is a rare but potentially fatal disease which can occur in children or teenagers during a viral illness (e.g. chicken pox or influenza). Often, the victim contracts RS just as he or she appears to be recovering from the initial infection. The use of ASA (Acetylsalicylic Acid) in treating the symptoms of viral or respitory infections, has been strongly associated with the development of RS, although the syndrome does occur spontaneously in rare instances. However, it is still not known exactly how ASA use is associated with RS, nor why it appears to affect predominantly children, teenagers and young adults.

What are the symptoms of Reye's Syndrome?

The symptoms of RS may include:

- persistence or resurgence of symptoms of the original illness;
- personality changes in the affected child or teenager, such as hyperactivity, aggression, disorientation, and anxiety;
- frequent or persistent vomiting and/or dry-heaving, convulsions, and delirium, possibly leading into a coma state.

If any of these symptoms appear, a doctor should be called immediately or emergency medical treatment should be sought. RS is fatal in 20 to 30 per cent of all cases, and can cause permanent brain damage in victims who survive.

What is being done about Reye's Syndrome?

Both the government and manufacturers are taking steps to educate the public about RS:

- Currently, manufacturers of all products containing ASA are voluntarily labelling their products with a warning to consult a doctor before giving the product to a child or teenager.

Canada

- The Health Protection Branch of Health and Welfare Canada has initiated a regulatory proposal to make mandatory the following warning:

  > "Acetylsalicylic acid for internal use shall carry a cautionary statement to the effect that the drug should not be administered to or used by a child or a teenager before a physician or a pharmacist is consulted about Reye's syndrome."

  This will ensure that ASA products are administered to children only for relief of pain and not for fever.

- In addition, Health and Welfare Canada has published two information pamphlets, "Reye's Syndrome" and "Reye's Syndrome - All Parents and Teenagers be Informed". These publications were distributed in 1983 and 1987, respectively, with family allowance cheques.

- Finally, the Health Protection Branch is working with the provinces on a proposal to restrict the sale of children's non-prescription medications which contain ASA to pharmacies.

What can individuals do?

If your child has a fever, there are other measures that can be taken to bring down the child's temperature in addition to, or instead of, medication:

- Give the child plenty of liquids to drink, preferably water, flat ginger ale, diluted apple juice, or other sugared drinks. Avoid milk, carbonated drinks, and tart drinks (orange, cranberry, grapefruit etc.) as they might upset the child's stomach.

- Remove excess covers and clothing, and keep the room temperature around 18 degrees Celsius (about 64 degrees Fahrenheit). Bathe or sponge the child with lukewarm water.

- If the fever does not respond to these measures, consult your family doctor.

Never attempt to treat a feverish child under 12 months of age without the advice of a doctor. Never give any drug containing ASA to a child, particularly if he or she has the flu or chicken pox, before consulting a physician. Make sure that teenagers are also aware of the dangers of RS and how to prevent it.

Conclusion

In addition to the non-drug remedies mentioned previously, there are other drugs to relieve fever, such as acetaminophen. It is important to remember that some common symptoms are signs of more serious illnesses; if the symptoms persist for more than two days or become worse, a physician should be consulted.

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Reye's Syndrome is one of Health Protection Branch **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups concerned with health protection in Canada.

Aussi disponible en français.

Health Protection Branch

ISSUES

FOOD CHEMICAL CONTAMINANTS - ASSESSING HEALTH RISKS

The Health Protection Branch of Health and Welfare Canada is regularly called upon to assess the potential risk to Canadians of dietary exposure to a wide variety of toxic substances. Where a health risk is identified in foods in the marketplace, the Branch is authorized under the Food and Drugs Act to take corrective action. The Branch also serves as a health advisor in situations that are not subject to the Food and Drugs Act. For example, advice may be provided to assist such groups as native communities and sportsfishermen.

Canadians may be exposed to toxic substances through a variety of sources, including food, water, air, soil, and consumer products. This information sheet outlines how the Branch approaches health risk assessments involving food chemical contaminants. Similar approaches are used in addressing potential health threats from other sources.

Health risk assessment of food chemical contaminants is a scientific, multi-step process.

Step One: Determining Tolerable Daily Intake

Step one of the process is to determine the toxicity of the chemical contaminant -- or its capacity to cause harm. This enables scientists to establish a quantity of the chemical that humans can consume on a daily basis, for a lifetime, with reasonable assurance that their health will not be threatened. This quantity is called the Tolerable Daily Intake, or TDI.

TDI's for humans are usually based on studies carried out on laboratory animals. In these studies, researchers establish a level of exposure to the chemical at which no adverse effects are observed in the animals. This level is then divided by a safety factor to derive the TDI. Depending on the extent of the laboratory studies and the adverse effects that the substance can cause, the safety factor may range from 100 to several thousand or more.

Step Two: Determining Probable Daily Intake

The second step in the health risk assessment process is to determine the Probable Daily Intake, or the PDI, of the chemical contaminant.

To do this, scientists must first identify all foods that may contain the substance being evaluated, keeping in mind that the chemical may occur naturally in some foods. It is also necessary to determine which foods, if any, can contribute more of the contaminant than others.

Food intake is the second factor that contributes to dietary exposure to a specified chemical contaminant. Collecting valid data is extremely difficult since food consumption habits vary greatly based on such factors as gender, age, demographic location, cultural background, socio-economic status. Both average and high consumption rates must be taken into account, as well as the potential exposure of specific sub-groups in the population (such as pregnant women, children or the elderly).

It is necessary in certain instances to estimate the dietary intake of contaminants by certain segments of the population by using regional and subregional data on food consumption patterns. For example, country foods such as fish, game birds, marine animals and other foods which are often not commercially available are collected during fishing and hunting activities and are part of the daily diet of many native communities and sportspersons across Canada. Knowledge of the type and amount of country foods consumed as well as how they are prepared is essential to estimate the potential exposure of these Canadians to chemical contaminants from the food supply.

Finally, consideration must be given to other potential sources of exposure, such as air and water, in order to arrive at a realistic estimate of Probable Daily Intake.

Step Three: Comparing TDI and PDI

The final step in the process is to compare the Tolerable Daily Intake and the Probable Daily Intake of the contaminant under review. If the PDI exceeds the TDI, risk management options are considered. The options include:

- establishing guidelines or promulgating specific regulations controlling the toxic substance or substances;
- restricting the sale or distribution of food produced in an area which may have been identified as the source of the contamination;
- recommending changes in dietary habits.

Before initiating any specific action, however, the Health Protection Branch must assess its advantages and disadvantages. For example, removal of certain foods from the market or recommendations to change dietary habits could deny the people at risk of an essential source of nutrition, which might in itself cause more serious health problems than those associated with the chemical contaminant.

This is especially true in the case of Canadians who prefer traditional or non-conventional food sources. For example, those native communities which continue to rely on country foods as a major source of nutrition need to have at their disposal information on the nutritional benefits of such foods as well as the potential risks associated with the presence of chemical contaminants. Information of this type would permit consumers to make informed decisions about the foods they eat.

Conclusion

Health risk assessments of food chemical contaminants are carried out using the best available data. Such assessments determine whether there is a risk to public health so that options for managing the risk can be developed.

In this endeavour, the specific needs of the populations exposed to contaminants are taken into consideration. Whether Canadians' food sources are purchased through commercial establishments or obtained totally or partially from recreational or subsistence country foods, each food source must be considered on a case-by-case basis. The nutritional importance of the food is a crucial factor in taking action to reduce the risk.

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Food Chemical Contaminants - Assessing Health Risks is one of Health Protection Branch **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups interested in health protection in Canada.

Aussi disponible en français.

Direction générale de la Protection de la Santé

Actualités

DISPOSITIFS DE TRAITEMENT DE L'EAU pour l'élimination du goût, de l'odeur et des substances chimiques

Introduction

Les Canadiens sont de plus en plus sensibilisés à la pollution du milieu et aux limites des processus de traitement de l'eau. Comme une eau potable de qualité est essentielle à la santé, sa qualité aux plans chimique et biologique revêt une grande importance.

Bien qu'on associe souvent la présence de substances chimiques dans notre eau potable à la pollution et aux maladies, il importe de savoir que l'eau pure au plan chimique n'existe pas dans la nature. L'eau, solvant universel, contient *toujours* une certaine quantité de substances chimiques et de minéraux. De plus, au Canada, les réserves d'eau potable sont pour ainsi dire exemptes des micro-organismes pathogènes qu'on trouve dans les réserves d'eau de nombreux pays en développement.

Cela n'empêche pas les dispositifs de traitement de l'eau d'avoir connu une grande popularité dans les foyers au cours des dernières années. On estime que 100 000 unités sont vendues annuellement au Canada. On a tendance à croire que les systèmes de traitement de l'eau jouent un rôle intermédiaire entre la prévention d'un risque connu et l'amélioration de l'apparence, du goût et de l'odeur de notre eau potable.

Types de dispositifs

Les dispositifs de traitement de l'eau se répartissent en deux groupes, selon leur fonction. Il sera question ici de ceux qui améliorent le goût, l'odeur et l'apparence de l'eau ou qui en éliminent les substances chimiques et les minéraux indésirables. On traite de ceux qui servent à désinfecter l'eau contaminée dans les *Actualités* de la Direction générale de la protection de la santé intitulées *Dispositifs de traitement de l'eau -- pour l'élimination des micro-organismes présents dans l'eau.*

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Les dispositifs *aux points d'utilisation* s'installent sur un robinet, voire plusieurs, et ne servent qu'à traiter l'eau utilisée pour la consommation et dans la préparation des aliments. Quant aux dispositifs *aux points d'entrée*, ils sont placés sur le conduit principal et traitent toute l'eau utilisée dans la maison.

On se sert de plusieurs types de dispositifs pour améliorer les qualités esthétiques de l'eau potable et pour en éliminer les substances chimiques. Ceux qui sont dotés d'un filtre à charbon actif sont les plus courants, et s'installent généralement aux points d'utilisation. Les filtres à charbon actif sont généralement plus efficaces pour éliminer les substances chimiques organiques. On s'en sert souvent pour améliorer le goût, l'odeur et l'apparence de l'eau, et on les allie à d'autres processus de traitement pour obtenir une purification plus complète.

On utilise un certain nombre de ces dispositifs surtout pour éliminer les substances chimiques indésirables de l'eau potable. Parmi les processus sous-jacents, on compte l'osmose inverse, l'échange d'ions et la distillation.

Un dispositif qui agit par *osmose inverse* consiste habituellement en une membrane semi-perméable, en un réservoir d'eau et en un robinet de distribution. Il permet d'éliminer les substances chimiques inorganiques et est souvent allié à un filtre à charbon actif, qui, lui, permet d'éliminer le chlore et les substances chimiques organiques.

On peut se procurer ces divers produits présentés sous forme de pichets. En plus d'être munis de filtres à charbon actif, les dispositifs peuvent également faire appel à une résine échangeuse d'ions qui sert à l'élimination des substances chimiques inorganiques qui causent la «dureté» de l'eau.

On fait appel à la *distillation* couramment pour réduire le taux de substances chimiques dans l'eau potable. Dans ces dispositifs, l'eau bout dans un compartiment, puis sa vapeur est condensée et accumulée dans un autre. Les systèmes de distillation sont efficaces pour l'élimination des substances chimiques tant organiques qu'inorganiques, mais on leur allie souvent le charbon actif pour éliminer certaines des substances chimiques «volatiles» (par exemple, trihalométhanes, tétrachloroéthylène). On n'associe ni effet bénéfique ni effet néfaste à l'ingestion d'eau déminéralisée ou distillée.

Deux des dispositifs de traitement de l'eau *aux points d'entrée* dont on se sert fréquemment sont les *adoucisseurs d'eau* et les *filtres au sable vert*. On s'en sert souvent pour adoucir l'eau des puits dans les régions rurales. Les adoucisseurs d'eau ne font qu'atténuer la dureté de l'eau et n'éliminent aucune substance chimique organique. Quant aux filtres de sable vert, ils sont conçus surtout pour éliminer le fer, le manganèse et le sulfure d'hydrogène de l'eau.

Problèmes de santé éventuels associés à l'utilisation de dispositifs de traitement de l'eau

Les filtres à charbon actif dont on se sert dans beaucoup de dispositifs de traitement de l'eau peuvent eux-mêmes devenir une source de contamination. Avec le temps, le filtre peut se saturer de contaminants chimiques, ce qui donne lieu à la libération de ces composés dans l'eau filtrée, probablement en concentrations plus élevées que dans l'eau de départ. En outre, une accumulation de matières organiques sur le filtre peut favoriser la prolifération bactérienne en peu de temps, même en une nuit. Certains fabricants ont mis au point diverses méthodes permettant de réduire la prolifération bactérienne, notamment l'ajout d'argent, mais leur efficacité est douteuse.

Bien qu'il soit préférable d'avoir de l'eau douce pour la lessive et qu'elle aide à prévenir la formation de dépôts dans les appareils et les tuyaux, on recommande généralement de ne pas la boire ni de l'utiliser pour la cuisson en raison de sa teneur accrue en sodium, de sa concentration réduite en minéraux essentiels et de la possibilité de prolifération bactérienne. *Nota : les bactéries peuvent également proliférer dans des filtres de sable vert.* Une variété d'adoucisseurs d'eau et de conditionneurs sans sel ont été introduits sur le marché. Bien que l'utilisation de ces dispositifs ne semble pas poser de risques pour la santé, on doute toutefois de leur efficacité.

Conseils au consommateur

Le risque pour la santé associé à l'emploi d'un dispositif de traitement de l'eau qui fait appel à un filtre au charbon actif peut être réduit si on suit les étapes suivantes :

1. ne se servir que de l'eau traitée par la municipalité ou d'autres réserves d'eau que l'on sait exempte de tout contaminant bactérien;

2. purger le système au moins 30 secondes avant chaque utilisation;

3. changer les filtres ou les unités (si l'unité est jetable) fréquemment;

4. suivre fidèlement les directives du fabricant quant à l'installation et à l'entretien.

L'eau qui n'est pas consommée immédiatement après qu'on l'a traitée aux points d'utilisation devrait toujours être réfrigérée; on évite ainsi toute contamination bactérienne.

Conclusions

Bien qu'il n'existe actuellement aucune loi régissant les dispositifs de traitement de l'eau, Santé et Bien-être social Canada considère qu'il est essentiel que l'eau soumise à un traitement satisfasse aux critères de qualité établis dans les *Recommandations pour la qualité de l'eau potable au Canada* (Santé et Bien-être social Canada, 4e édition, 1989). Il est à noter que l'eau qui satisfait déjà aux critères établis dans les recommandations n'a habituellement pas à subir un traitement additionnel, du moins pas pour des questions de santé.

Santé et Bien-être social Canada insiste pour que les filtres au charbon actif et tout le matériel lié au conditionnement, à la promotion et aux directives portent clairement la mention «*N'utiliser qu'avec de l'eau traitée par la municipalité ou provenant d'une réserve que l'on sait exempte de contaminants microbiologiques*». Cette mention est conforme aux lignes directrices volontaires mises au point par l'Association canadienne pour la qualité de l'eau concernant la publicité et la promotion des filtres au charbon actif.

En outre, Santé et Bien-être social Canada a travaillé en étroite collaboration avec la National Sanitation Foundation à l'établissement de normes de rendement pour les dispositifs de traitement de l'eau. Le Ministère encourage les fabricants à faire certifier leurs produits selon les normes de la National Sanitation Foundation. Ces normes, de même que la liste établie par la National Sanitation Foundation, sont maintenant couramment admises en Amérique du Nord et dénotent un rendement spécifique, d'une marque et d'un modèle, pour l'élimination de contaminants spécifiques, ainsi que l'intégrité mécanique des dispositifs.

À long terme, la conformité à ces normes de rendement devrait rendre la sélection d'un dispositif adéquat beaucoup plus facile pour le consommateur canadien.

Comme on le souligne dans le *Plan vert du Canada pour un environnement sain*, le gouvernement fédéral entend introduire en 1991 une *loi sur la qualité de l'eau potable*. Dans cette loi, on mettra notamment au point des critères de qualité pour les dispositifs de traitement de l'eau aux points d'utilisation.

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le 15 août, 1991

Dispositifs de traitement de l'eau -- pour l'élimination du goût, de l'odeur et des substances chimiques fait partie d'une série de publications intitulées **Actualités** et publiées par la Direction générale de la protection de la santé, de Santé et Bien-être social Canada, pour le public, les médias et les groupes d'intérêt spéciaux préoccupés par la protection de la santé au Canada.

Also availabe in English.

Health and Welfare Canada
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Health Protection Branch

ISSUES

PRESSURE-TREATED ("PRESERVED") WOOD AND WOOD PRESERVATIVES

Introduction

Pressure-treated wood is popular for building fences, decks, play structures, house foundations, barns, storage facilities, docks, play equipment, and other durable wooden structures. Proper pressure treatment of wood with preservative chemicals helps to protect lumber from insects and fungi which can destroy it. However, the preservative chemicals are toxic. These chemicals and the treated wood must be handled and used carefully to avoid ill effects on people, the environment and animals.

Kinds of wood preservatives used for pressure treating wood

Pressure-treating wood with heavy-duty chemicals is the only way to preserve it over long periods of time. In Canada, the most commonly used preservatives are creosote, copper-chromium-arsenate (CCA) and pentachlorophenol (PCP). Although creosote is available for home use, CCA and pentachlorophenol are used only in wood treatment plants. Creosote is a dark liquid with a sharp, tar-like odour. It is used mostly for treating railway ties, and timber for docks, pilings, bridges, and utility poles. Pentachlorophenol is a colourless chemical used for pressure-treating utility poles and railway ties. Over the years, its use has declined because it is volatile, and contains toxic contaminants such as dioxins. Nowadays, the preservative used most often is CCA, a mixture of salts of copper, chromium and arsenic. CCA gives a slightly greenish colour to treated wood. (Some less toxic chemicals, such as copper naphthenate, also have a greenish colour).

CCA is different from pentachlorophenol and creosote, because it binds easily with the wood during the treatment process. Pentachlorophenol and creosote do not combine well with the wood, and are more likely to evaporate or migrate from the wood.

Canada

Human Exposure to Wood Preservatives and to Pressure-Treated Wood

People are exposed to preservatives when they pressure-treat the wood, and when they handle or work with it. They may breathe in fumes or dust laden with preservative chemicals. As well, their skin may come into contact with the chemicals or with the treated wood. Protective clothing and equipment and proper hygiene will help to reduce exposure in such cases.

The exposure is greater for workers in wood treatment plants. They may come into frequent direct contact both with traces of the treatment solution, and with treated wood. Construction workers who handle, drill, saw, or grind treated wood, may also have a high exposure. People who sell freshly treated lumber, and linemen who often have to climb pressure-treated utility poles may be regularly exposed. People can come into contact with fences, decks, park benches, picnic tables, and other outdoor structures built of pressure-treated wood. However, this kind of contact would probably not lead to worrisome exposures. Properly treated and seasoned wood used outdoors does not easily release large amounts of preservative. Because the wood is exposed to rain, any preservative not bound to it will wash off.

Treated wood may cause some environmental contamination, as the chemicals slowly migrate out of the treated wood and out of treatment wastes into the air, soil or water. This can lead to exposure through contaminated water and food. Because treated wood can produce highly toxic fumes and ashes when it burns, it should not be used as a fuel.

There is little information on the amount of CCA, creosote or pentachlorophenol absorbed by people or animals. Most exposure studies were done on workers in industries which used chlorophenols as wood protectants or wood preservatives. Reports in the medical literature show that high exposures occur when burning or grinding treated wood, or when the chemicals or wood are used in the interior of homes. The preservative chemicals can be absorbed by inhalation, ingestion, and through the skin.

Provincial ministries of agriculture have set guidelines for using preservative-treated wood in barns and other structures designed for livestock. Improper use of the wood or the chemicals can lead to illness in animals, and to traces of the chemicals in meat, dairy products, and other animal products. This is more likely to occur with volatile chemicals such as pentachlorophenol and creosote. Preservative-treated wood should not be used to line wells or water conduits, or any other containers which may come into direct contact with feed or food.

Health Effects

On rare occasions, toxic effects of wood preservatives and pressure-treated wood have been seen both in animals and people. The effects range from slight illnesses to deaths. Accidental illnesses or deaths were traced to improper or careless use of the preservative chemicals or treated wood in the workplace or in the home.

We don't know very much about the long-term effects of frequent exposure to wood preservatives. Some health studies have been carried out on workers in the wood preservation and lumber industry, and people living in houses containing treated wood. Most of the studies showed little or no obvious effects on normal organ function and on health. However, some people heavily exposed to preservative chemicals either in the home or the workplace have become seriously ill; a few have died.

Experiments with laboratory animals show that excessive exposure to some components of creosote, and to chlorophenols or chlorophenol contaminants, may cause cancer.

Studies in smelting and metal-processing industries have shown that arsenic and chromium (which are present in CCA-type wood preservatives) can irritate the skin, and may cause or promote some forms of cancer.

It is therefore advisable to limit exposure to preservative chemicals and to freshly treated wood.

Safety Tips

- Wear gloves to avoid direct skin contact when handling or working with pressure-treated wood. Wear gloves.
- Avoid frequent or prolonged inhalation of sawdust from treated wood. When sawing and machining treated wood, especially in confined areas, wear a dust mask. If possible, do these job outdoors.
- Wear goggles to protect eyes from flying particles when power-sawing or machining.
- Wash exposed skin thoroughly after contact, and especially before eating, drinking or using tobacco products.

- If preservatives or sawdust collect on clothes, wash the clothes before re-wearing. These clothes should be washed separately from other clothing.

Conclusion

Heavy duty wood preservatives contain toxic chemicals. Only properly trained and equipped workers in wood preservations plants should use these chemicals.

Pressure-treated wood should be used carefully. Special precautions must be taken when drilling, sawing, and sanding treated wood. It should not be used indoors or where it could come into contact with water, feed, or food. The Department of National Health and Welfare is studying some of the factors which affect the release of preservative chemicals from pressure-treated wood. Federal and provincial government agencies, and the treatment and user industries are also taking steps to improve the safety of the treatment processes and of the treated wood.

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October 30, 1991

Pressure-treated (Preserved) Wood and Wood Preservatives is one of a series of Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

Aussi disponible en français.

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ISSUES

HEALTH EFFECTS OF GROUND-LEVEL OZONE

When most Canadians think of ozone, they think of the protective layer high above the earth's surface, in an area known as the stratosphere. In the right place, 40 kilometres above us, this poisonous gas acts as a global sunscreen, filtering out harmful ultra-violet rays from the sun. There is another type of ozone - this one right here on the ground. Ozone becomes a problem at ground level because, when inhaled, it is hazardous to human health.

What is Ozone? - A product and a partner of pollution

High concentrations of ground-level ozone occur when its precursors, nitrogen oxides and volatile organic compounds, combine in the presence of sunlight. Nitrogen oxides (NO_x) are a class of compounds containing nitrogen and oxygen. Many natural biogenic processes, such as bacterial action in the soil, lightning, volcanoes, and forest fires produce these gases. Man-made nitrogen oxide emissions are the result of burning of fossil-fuels such as oil and coal. Motor vehicle exhaust, certain chemical manufacturing industries, fossil-fuel power plants and factories are the major sources. Volatile organic compounds (VOCs) are organic gases and vapours that evaporate into the air easily. Various industrial processes release VOCs during combustion. VOCs are also released from evaporation of liquid fuels, solvents and organic chemicals, like barbecue starter fluid, nail polish remover, and gasoline fumes. Forests are the main source of naturally occurring VOCs.

When nitrogen oxides and VOCs combine in the presence of sunlight they are changed into photochemical oxidants, the most important of which is ozone. Besides their contribution to the formation of ozone, both NO_x and VOCs are pollutants in their own right. They also have the potential to cause adverse health effects. Ozone mixes with these and other pollutants to form a brownish-yellow haze or "smog" that sometimes hangs in warm still air over many Canadian cities. This chemical soup also can affect people's health.

Canada

When and where

Ground-level ozone is primarily a warm weather phenomenon that knows no international, national or municipal boundaries. The afternoons and early evenings of hot, humid summer days, whether sunny or cloudy, are peak ground-level ozone periods. By late in the day, the sun's rays have cooked the growing levels of exhaust from motor vehicles and industries.

Not surprisingly, ground-level ozone is common around urban centres, where there are many motor vehicles and industries.

In Canada, high concentrations of ozone frequently occur in the Windsor-Quebec corridor, the Lower Fraser Valley and the South Atlantic region. Other urban centres are also subject to high ozone levels two to three times per year. In 1988, for example, Windsor experienced 189 hours during which the level of ozone exceeded the maximum acceptable level. In North York, London and Oakville, ozone levels exceeded the maximum acceptable levels by at least 122 hours.

The less industrialized parts of Canada are not immune to ozone pollution. Prevailing winds and weather patterns can transport ground-level ozone and the pollutants that produce ozone hundreds of kilometres to other cities and rural areas. For example, the dominant air flow in eastern North America is northeasterly. Therefore, Atlantic Canada inherits the polluted atmosphere of several large cities along the Eastern seaboard.

Periods of high ground-level ozone often last several days and frequently occur when a stagnant air mass traps pollutants over a region. Short duration ozone episodes, during which ozone concentrations exceed the acceptable health standard, are a growing public health concern.

Its health effects

Ground-level ozone is a powerful and irritating air pollutant. Short term exposure, one to two hours, can irritate people's eyes, nose and throat. It can also produce respiratory symptoms such as coughing and painful deep breathing. People's ability to inhale and exhale normally can also be affected, as measured by the maximum amount of air one can exhale after taking a deep breath. Scientific evidence suggests that people may adapt to the immediate effects of ozone - after a few days of continuous exposure the discomfort disappears.

The health effects of low level, long term or repeated exposures are not well-known. Ozone exposure appears to decrease the lungs' ability to ward off disease, possibly increasing susceptibility to other respiratory illnesses. In addition, animal studies have shown a tendency towards 'stiffening' of the lung. Lung function will then decline at a faster rate, a step in premature aging. Scientists are now looking at possible cellular and tissue changes that long-term ozone exposure may cause in humans.

Unlike other pollutants, there are no special risk groups to ground-level ozone exposure. Ironically, healthy individuals may be the most vulnerable. Those who work or exercise outdoors are at greater risk of experiencing symptoms known to occur with ozone exposure. The more activity that people undertake, especially during periods of high ozone, the more ozone they breathe in. The resulting health effects may include coughing, chest pain, shortness of breath, decreased work capacity and decreased athletic performance.

Scientists suggest that a small part of the general population (5-20 per cent) may, for no clear reason, be significantly more sensitive to a given dose of ozone. A recent clinical study of asthmatics suggests that ozone exposure may be associated with increased sensitivity to allergens. Also, people with respiratory problems may suffer more symptoms and hospital admission during periods of high ozone.

Reducing your exposure to ground-level ozone

There are many immediate and long-term steps that can be taken to reduce exposure to ground-level ozone. The presence of 'smog' is usually an indicator of high levels of ground-level ozone. Particularly on hot, humid summer days it would be wise to:

reduce the emission of air pollutants by:

- using public transport or a bicycle instead of your car; and
- avoiding the use of other gasoline-powered vehicles such as motorbikes, motorboats and gas lawnmowers.

change your outdoor activities by:

- avoiding outdoor aerobic exercise, especially during the afternoon and early evening when ozone levels are at their highest. **Choose indoor activities during these times**. Even during high ozone periods, indoor levels of ozone are significantly less.

Some long-term approaches to reducing ozone production include:

- using a bus or train for medium distance travelling;
- set-up car pools for work and recreational activities;
- keeping your car well-maintained and driving at a steady, moderate speed to conserve fuel; and
- reducing your household use of chemicals. When using chemicals in the home, always reseal containers of paints, glues and paint thinners to avoid evaporation of volatile organic compounds into the environment.

Federal government action on ozone

Permissible ground-level ozone standards vary from country to country. Federal and provincial governments have jointly developed National Ambient Air Quality Objectives for several pollutants, including ozone. There are three levels to these national objectives:

maximum desirable	the long-term goal for air quality;
maximum acceptable	the level that adequately protects soil, water, vegetation, materials, animals, visibility, personal comfort and well-being; and,
maximum tolerable	the level established to protect human health.

According to this standard, in Canada, the highest amount of acceptable ozone over a one-hour period is 82 parts per billion (ppb). Over a 24-hour and one year period, the acceptable levels are 25 and 15 ppb, respectively. This ozone guideline is one of the most stringent in the world.

As part of *Canada's Green Plan*, the Health Protection Branch of Health and Welfare Canada is developing a comprehensive program to address the complex health issues surrounding air pollution. The year 1990 saw the introduction of the NO_x/VOC management plan to develop a coordinated national approach to cause a reduction in these ozone-forming pollutants.

Health and Welfare Canada, in collaboration with Environment Canada, will continue to assess the effects of short- and long-term exposure to several pollutants including ozone. The results of these studies will allow further development of effective standards and guidelines, to help protect the health of Canadians.

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Ground Level Ozone is one of Health Protection Branch Issues produced Health and Welfare Canada for the public, media and special interest groups.

Aussi disponible en français.

Health and Welfare Canada
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Health Protection Branch

Issues

HOME RENOVATIONS -- REMOVING LEAD-BASED PAINT

Introduction

Many Canadians are choosing to renovate their homes rather than move to new ones. Besides making good economic sense, renovating can be a very rewarding experience.

However, older homes may contain lead-based paint. Removing old lead-based paint as part of a renovation project can expose people in your home to a health risk. So, before you take out the paint stripping equipment, there are some things you should know about removing paint.

Health effects of lead exposure

We've known for a long time that lead is hazardous to health. Scientists now realize that even small amounts of lead can be harmful, especially to infants and young children. In addition, lead taken in by the mother can interfere with the health of the unborn child.

Children are particularly at risk because they absorb lead more easily than adults do. They are developing rapidly, and are more susceptible to the health hazards of lead. Children also absorb a higher proportion of lead from other sources (food, water and dust, for example) than adults. Contaminated dust is a particularly important source of exposure for babies and small children because they can ingest a significant amount of dust through their natural habit of putting things in their mouths.

The degree of lead poisoning varies depending on the amount of lead we are exposed to, and for how long. Studies show that prolonged exposure of children to even very small amounts of lead is serious. Depending on the level of exposure, lead can cause anemia, impair the functions of the brain and nervous system, and can result in learning disabilities and an inability to concentrate.

Canada

Does my home contain lead-based paint?

If your home was built before 1960, it was likely painted with a lead-based paint. Most paints made before 1950 contained large amounts of lead. In fact, some paint made in the 1940's contained up to 50 per cent lead by dry weight. Lead was used to make paint dry quickly and wear well, and to make the colours vibrant. The amount and kind of lead varies in different types of paint.

You can find out the level of lead in your paint by scientific testing. Your Ministry of Environment may offer this service. Failing that, try a professional lab, preferably one accredited by the Standards Council of Canada.

Since the 1950's, the use of lead has been more common in exterior paint than interior paint. Exterior paint that contains lead will carry a warning label; this paint should not be used on the inside of a building.

Between 1950 and 1976, the use of lead in paints decreased significantly. In 1976, the Hazardous Products Act limited the amount of lead in interior paint and in paint accessible to children to 0.5 per cent by dry weight. Owners of homes built after 1980 need not be concerned about lead levels in interior paints.

If there is lead-based paint in my home, should I remove it?

Lead-based paint doesn't present a health hazard as long as the paint is not chipping or flaking, and isn't where it can be chewed by young children, for example, on window sills, older painted cribs and toys, etc. In fact, removing old paint can sometimes result in a more immediate hazard than simply leaving the painted area intact.

Sanding sends a cloud of paint dust and scatters paint chips through the entire house. Dust from lead-based paint can contaminate the air you breathe, everything you touch, and any food that is exposed. Paint chips might be eaten by young children. Heat guns and blowlamps vaporize the paint, and can fill the air with leaded fumes. These fumes, and paint dust can migrate out-of-doors, spreading the lead to soils and gardens, and contributing to the build up of lead throughout the environment.

To lessen any chance of exposure to leaded-paint, surfaces that are still in good condition can be covered with vinyl wallpaper, wallboard or panelling. In areas that children can't reach, applying one or more coats of non-leaded paint to old but intact surfaces will help.

And if I decide to remove the paint?

The usual methods of removing paint involve sanding or using a heat gun or blowlamp, or chemical paint strippers.

Sanding, heat guns and blowlamps **should not** be used to remove lead-based paint for the reasons mentioned above.

Probably the safest way to remove lead-based paint is to use a chemical stripper. Application strippers, which consist of a paste applied with a brush, are best. However, all chemical paint strippers contain potentially harmful substances, so care must be taken when using them. Not all strippers are equally good for removing paint from the same materials -- read the manufacturer's instructions carefully.

Safe practices to follow

No matter which method you choose to remove old paint, and regardless of whether the paint is on the inside or outside of your home, there are some very important rules to follow.

- Extensive renovation can pose hazards to anyone's health. Pre-school children and pregnant women are especially susceptible to leaded dust. They should limit their exposure as much as possible.

- Remove as much of the furnishings from the work area as possible. Furniture and carpets that can't be removed should be covered completely with plastic sheeting.

- Isolate the work area to prevent the spread of scrapings, chips and particles of paint to other parts of the house. This can be done by covering doorways and vents with plastic sheeting and tape.

- If you develop breathing problems, dizziness, nausea or headaches while working with paint strippers, get outdoors into fresh air. Before starting work, make sure the room is properly ventilated. Place an electric fan between the entrance to the room and an open window. Use it at its maximum setting to be sure that there is forced ventilation to the exterior.

- Always wear goggles and gloves when using paint strippers. If stripper gets on your skin, wash it off right away, and remove any clothing on which the stripper has spilt. Use a good quality breathing mask designed for use with organic chemicals. These can be purchased at specialized paint or safety equipment outlets. It's a good idea to keep a pair of coveralls and work shoes to wear only in the work area. Wash all work clothes separately from other clothing.

- Work for only about 10 minutes at a time and then take a break outside in the fresh air.

- Never eat, drink or smoke while removing paint.

- Keep all sources of ignition, including anything that might cause a spark or static electricity, out of the work area - many strippers are flammable.

- Clean the work area thoroughly at the end of each day. Collect paint scrapings and chips and place them in a sealed container clearly marked Lead-containing paint scrapings - Hazardous Waste. Wipe the entire work area with a clean damp cloth, and discard the cloth when you're done. In many parts of Canada, special arrangements exist for the disposal of hazardous household wastes. Paint scrapings should not be discarded with the garbage. To find out how to dispose of old paint strippings, contact either your local municipality, or the local office of the provincial Ministry of the Environment.

Consider professional help

Another option is to have professionals do the job either in your home, or remove the woodwork for stripping at their shop. If you hire professionals to remove the paint in your home, make sure they follow the advice given here - the method of stripping, proper ventilation, cleaning up, etc.

How can people be checked for lead?

Through a simple blood test, your family physician can determine how much lead you have been exposed to. For further information, contact your physician or the Poison Information Centre in your area.

What is the government doing to reduce exposure to lead?

The federal government is working to limit all sources of lead exposure to Canadians (for example, removing lead from gasoline, controlling industrial emissions, removing lead from pipe solder).

In 1976, the Hazardous Products Act limited the amount of lead in interior paint to 0.5 per cent by weight. Over the years, the amount of lead in paint has continued to decrease due to cooperative efforts of government and industry. The Canadian Paint and Coatings Association (CPCA), the national trade association for Canada's paint manufacturers, has recommended that the Canadian paint industry voluntarily stop using any lead compounds in consumer paints by the end of 1990.

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Home Renovations - Removing Lead-Based Paints is one of a series of Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

Aussi disponible en français.

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ISSUES

LET'S TALK TURKEY

Your turkey dinner was scrumptious. A succulent bird, cranberries, mashed potatoes... the works.

Then why do you feel so rotten now? The cramps and the diarrhea struck early this morning and this illness is threatening to ruin your whole holiday.

Most people would blame the flu, but food poisoning is the actual culprit. Salmonella isn't exactly a household word, but it should be. Thousands of Canadians each year get food poisoning after eating food contaminated by this and other types of bacteria. The heat of cooking usually kills Salmonella bacteria. However, improper techniques of storage, preparation or cooking of poultry can put you and your family at risk. Although poultry frequently carries Salmonella, other foods such as meat, fish, eggs and unpasteurized dairy products can be a problem too.

A few easy steps in the kitchen can help you and your family have a safe holiday.

YOU CAN'T TELL BY LOOKING

- It's not possible to tell by looking whether food has been contaminated, so treat all poultry and meat as though it is.
- When you bring poultry home from the store, refrigerate or freeze it immediately. Fresh poultry should be used within two or three days.
- Frozen poultry can be safely thawed in the refrigerator, in cold water, or in the microwave. If you must thaw at room temperature, wrap the bird in a heavy paper bag so the outside doesn't become warm before the inside thaws.
- Drippings produced during thawing should be considered contaminated and affected surfaces should be cleaned and disinfected.

Canada

- Wash hands well before and after handling poultry. Avoid cross-contamination by keeping your utensils clean too, especially your cutting board. Plastic cutting boards are best because they are easier to sanitize. Wash boards well with hot soapy water and a small amount of chlorine bleach, then rinse and dry.

- Stuffing is a great place for bacteria to grow because it is dense, moist and tends to cool slowly. If you must stuff a bird, do it just before roasting. Once the bird is done, remove the stuffing right away. If you are cooking a large bird, roast the stuffing separately. If you buy pre-stuffed turkeys carefully follow all the manufacturers directions.

- Can you refreeze defrosted meat? You can if the meat is still cold and ice crystals are still present, or if the meat has been thawed recently in the refrigerator.

HOT AND COLD

In order to keep your holiday food safe, Health and Welfare Canada recommends that you follow these simple steps:

Refrigeration

- Bacteria flourish at room temperature -- so don't leave meat or other foods that should be refrigerated sitting on the kitchen counter. Take unfrozen raw meat out of the refrigerator just before you handle and cook it.

Cleanliness

- Wash hands before and after handling all types of meat and poultry.

- Thoroughly wash dishes, cutting boards, counters and utensils with hot soapy water and bleach after they are used for preparation of meats and poultry, before they are used again.

Cook thoroughly

- Never eat raw meat or poultry.

- Cook ground meats, poultry and rolled roasts through to the centre. Be certain juices are no longer pink.

- Make sure that **cooked** foods do not touch **uncooked** foods.

- Use a meat thermometer to make sure the poultry is completely cooked.

Keep it hot

- Cooked foods should be eaten while hot because foods left to cool at room temperature may allow the rapid growth of bacteria.

- Refrigerate leftover foods immediately.

MAKE SAFETY A HOUSEHOLD WORD

Follow these rules and have a safe and happy holiday.

- Keep hands and utensils clean.

- Keep hot foods hot and cold food cold. Remember the danger zone where bacteria multiply rapidly in food is between 4° to 60°C

- Take special care when handling large quantities of poultry, other meats, or any perishable food.

- Never "slow cook" poultry at low temperatures for a long period; it's not safe. Bacteria may be able to grow at these temperatures.

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Let's Talk Turkey is one of a series of Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups.

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ISSUES

HEPATITIS B

Hepatitis B is a disease caused by a virus which attacks the liver. Symptoms and signs in infected people range from very minor through to a flu-like illness to jaundice. About 10 per cent of infected individuals become carriers who may pass on the disease. Carriers frequently show no symptoms and may therefore infect others unknowingly. Ten per cent of adults and 90 per cent of infected infants may develop chronic hepatitis which may progress to cirrhosis and cancer of the liver. About one per cent of acute cases of Hepatitis B succumb quickly and die. In Canada, the disease is most commonly transmitted through sexual contact and injection drug use, and potentially through occupational exposure to blood and body fluids.

The occurrence of Hepatitis B is worldwide and considered endemic. This means there is a constant presence of the disease within a given geographic area. In Africa and Asia, Hepatitis B virus infection is particularly widespread among infants and children.

In Canada, Hepatitis B is endemic. The occurrence of the disease is highest among injection drug users and male homosexuals.

Accurate information on the occurrence of Hepatitis B in Canada is limited. In 1990, there were 3,021 cases reported and in 1989, 41 deaths. The Department of National Health and Welfare is promoting a surveillance system that will collect more accurate disease incidence data. The Department has also worked with the provinces and territories to standardize case definitions for the reporting of Hepatitis B infection.

Canada

Hepatitis B vaccines are available, but are not routinely given at the present time to all. Health workers make up the majority of recipients. The vaccine is also used in other populations that have an established risk of infection, e.g. male homosexuals and injection drug users. The strategy of restricting the immunization to those high risk groups does not appear to have been effective in reducing the occurrence of the disease. The National Advisory Committee on Immunization, in August 1991, has concluded that, to achieve significant control of Hepatitis B in Canada, universal immunization should be implemented.

Hepatitis B vaccine is considered one of the safest vaccines available. Rates of side effects reported in Canada are approximately 22 per 100,000 doses distributed. Over 20 million doses of the vaccine have been used worldwide. Approximately one million doses have been distributed in Canada.

Recent attention in the Canadian media has focused on the suggestion that there is an association between immunization against Hepatitis B and the chronic fatigue syndrome. There have been no reports or studies published in the scientific literature that suggests there is such an association in Canada or elsewhere. The Department of National Health and Welfare has found no evidence that an association between Hepatitis B immunization and chronic fatigue syndrome exists. We are not aware of any other country where this has been raised as an issue. Studies by vaccine manufacturers of other groups, for example, police and firefighters who have been immunized, have not identified this as a problem. The Department of National Health and Welfare will continue to monitor reported adverse medical outcomes after receipt of the Hepatitis B vaccine.

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ISSUES

THINNING OF THE OZONE LAYER

-- The Health Effects

Introduction

The earth's ozone layer protects all life on earth from excessive exposure to ultraviolet radiation from the sun. Ultraviolet radiation is a type of light invisible to the naked eye and emitted by the sun or certain kinds of lamps.

The ozone layer is being depleted by certain chemicals, such as chlorofluorocarbons (CFCs), halons, carbon tetrachloride and methyl chloroform. These gases spread into the stratosphere where they break down into their constituent elements. The chlorine and bromine released by the process depletes the ozone layer. As the ozone layer thins, the amount of ultraviolet radiation reaching the earth's surface increases.

Health effects

Exposure to ultraviolet radiation is one of the main causes of skin cancer. Cancer is not the only health effect. Increased exposure to ultraviolet radiation can also cause sunburn, tanning premature skin aging, cataracts and a decrease in the response of the immune system.

How can I protect myself and my family?

The best approach is to avoid needless, or over-exposure to ultraviolet radiation.

It is easy to protect ourselves from the harmful effects of the sun's rays all year round. It isn't necessary to have a tan to be healthy. Here are some simple suggestions:

Canada

- If possible, wear non-transparent clothing, long sleeved shirts, long pants, gloves and a brimmed hat or visor when you have to spend long periods in the sun.

- Avoid tanning for long periods of time, especially between 10 a.m. and 4 p.m. when the sun's rays are strongest.

- Use lots of sunscreen lotion, and reapply it often - every two hours - when working, playing, or exercising outside. Look for a broad-spectrum sunscreen with a rating of at least SPF-15.

- Don't be fooled by clouds - the sun's rays can penetrate light cloud cover, fog and haze.

Because their skin is thinner and more sensitive than an adult's, children and teenagers need extra protection from ultraviolet radiation.

- Children sunburn more easily than adults. Because sunburn may increase the risk of developing skin cancer later in life, sunburns should be avoided by everybody, but particularly by children.

- Never let young children stay in the sun for long periods of time, without adequate protection from the sun - protective clothing, sunscreen and sunglasses. All children should wear at least a sunhat, T-shirt and shorts.

- Get children and teenagers used to wearing sunscreen lotion, paying particular attention to the most exposed parts - ears, face, neck, shoulders and back, knees and tops of feet.

- If possible, wear sunglasses that screen out ultraviolet radiation. Eyes don't develop a tolerance to the sun. Damage to the lens of the eye from ultraviolet radiation can lead to cataracts.

What is the federal government doing?

In September 1987, 24 nations, including Canada, pledged to reduce the use of CFCs by 50 per cent by 1999, and to freeze the use of halons by 1992 at their 1986 levels. This agreement, the *Montreal Protocol on Substances That Deplete the Ozone Layer*, was the first of its kind and set a global precedent. Since then, the Montreal Protocol has been ratified by over 70 countries. The Protocol now calls for the total elimination of CFCs, halons, and carbon tetrachloride by the year 2000 and methyl chloroform by 2005.

Canada's current plan is to phase out all ozone-depleting substances as soon as possible, but no later than December 31, 1995 for CFCs and December 3l, 1994 for halons.

The Canadian Environmental Protection Act (CEPA) authorizes the federal government to conduct research and collect information on a wide variety of substances that contaminate the environment and cause adverse effects on health. Under CEPA, regulations on ozone-depleting substances were introduced. Regulation No. 1 controls the import, manufacture and use of CFCs; Regulation No. 2 prohibits manufacture in Canada, import to or export from Canada, of bromofluorocarbons; Regulation No. 3 prohibits the use of CFCs for specific lesser-essential uses or where substitutes are available.

Although these regulations have only been in force for two years, we have already reduced our consumption of CFCs by 45 per cent. The federal and provincial governments are working together to develop a national action plan for recovering and recycling CFC refrigerant. Three provinces already have regulations in place; the remaining provinces expect to introduce similar regulations by the end of 1992.

Conclusion

We have been naturally exposed to ultraviolet radiation throughout our lives. If the predictions of environmental scientists are correct, this summer may bring a little more ultraviolet radiation than usual into the environment.

We can continue to enjoy outdoor activities - as long as we protect our skin from the sun's rays with adequate clothing and sunscreen lotions and by avoiding sunburn and long exposure to sunlight for the sole purpose of tanning.

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ISSUES

THE PSYCHOACTIVE SUBSTANCE CONTROL BILL

A United Nations survey revealed that the world wide total dollar value of the illegal drug trade is second only to the amount spent on the arms trade. A Health and Welfare survey determined that approximately two percent of the general population used cocaine in 1989. That same year a survey of adults conducted by the Addiction Research Foundation found that 10.5 per cent admitted to using marijuana in the previous 12 months. And, despite the slight gradual decline in the use of most drugs, the drugs used today are being administered through more dangerous means and they are being used in more dangerous combinations.

Generally, it is the young who experiment with drugs. Many end up addicted. To protect them and all Canadians against this menace, the Federal Government is carrying out Canada's Drug Strategy---a multi-year program, first launched in May 1987. The Strategy strikes a balance between education and treatment on the one hand and enforcement on the other. One important aspect of the Strategy is the passage of new drug legislation called the *Psychoactive Substance Control Bill*.

The Bill consolidates, modernizes and enhances drug abuse provisions currently contained in the *Narcotic Control Act* (NCA) and Parts III and IV of the *Food and Drugs Act* (FDA). Parliament passed the NCA and Part III of the FDA in 1960-61. Part IV of the FDA was passed in 1969. Given the 30 year interim, these Acts are in need of updating.

The *Psychoactive Substance Control Bill* will also fulfil Canada's international obligations under the *Single Convention on Narcotic Drugs* and the *Convention on Psychotropic Substances*.

The NCA and the FDA cannot sufficiently address emerging trends in drug abuse. These Acts do not take into account psychoactive substances like "designer drugs" and "look-alike drugs." The present lack of comprehensive legislation often hampers enforcement efforts.

Canada

Psychoactive substances, also known as mood-altering drugs, can change or affect the way a person thinks, feels or acts. Psychoactive substances usually produce physical effects as well, but what sets them apart from other drugs is the manner in which they work on the mind and on the senses.

"Designer drugs" are potent psychoactive substances with slightly different chemical structures than substances presently controlled by the FDA and NCA (drugs like stimulants, tranquilizers and pain killers). Yet, these drugs affect users in similar ways and can produce the same health and social problems.

"Look-alike drugs" are psychoactive substances manufactured to resemble illegal substances. They mimic the activity of more powerful substances by combining mixtures of less potent and currently unrestricted ingredients. Products containing large amounts of ephedrine (used to relieve hayfever, asthma and nasal congestion), caffeine and phenylpropanolamine (found in some lozenges, appetite suppressants and decongestants) are examples. Substantial harm can be associated with the abusive use of these substances. School children are one of the primary targets of illegal distributors.

The manufacture and sale of "designer drugs" and "look-alike drugs" can be an enormously profitable business. Under the FDA and NCA, drugs must first be listed on a schedule to an Act (which regulates the conditions for drug sales in Canada) before it is an offence to sell them. Therefore, under current legislation, new drugs are not illegal until they are first analyzed and added to one of the Acts. This takes time. Meanwhile, those abusing these substances, not to mention society in general are at considerable and unnecessary risk.

To correct this drawback, the *Psychoactive Substance Control Bill* uses a broad description to define psychoactive substances. In future, new drugs appearing on the street which fit this description will be automatically covered by the new Bill.

Another ambiguous term is "precursors" which are substances, usually without psychoactive activity, that may be easily turned into or used to change another substance into psychoactive substances in clandestine laboratories. The *Psychoactive Substance Control Bill* contains provisions which enable authorities to regulate the import and export of these substances.

Occasionally, psychoactive substances intended for medical or scientific use are diverted and illegally sold on the street. These drugs are obtained: by theft from health care facilities, from illegally issued prescriptions, from double-doctoring (when criminals visit several doctors, thereby obtaining numerous prescriptions, issued in good faith, for the same ailment), or from forged prescription.

Society is directly harmed by trafficking in illegally obtained substances. Health professionals bill provincial medicare insurance for their illegal practices. The "patients" turn around and illegally sell the substance at highly inflated street prices. Furthermore, drug use results in lack of productivity and addiction requires rehabilitation.

People who deal in diverted pharmaceuticals make enormous profits. Under the *Psychoactive Substance Control Bill*, such people will be subject to fines and jail sentences imposed by the courts.

The Bureau of Dangerous Drugs and the Field Operations Directorate of Health and Welfare Canada will continue monitoring the distribution of all drugs. Health Propection Branch inspectors will continue to visit pharmacies, hospitals, licensed dealers, dispensing practitioners, researchers and analysts to ensure compliance with federal laws.

Another area addressed by the *Psychoactive Substance Control Bill* is the sophisticated networks used by people who sell, illegally produce, export or import psychoactive substances in Canada. These people buy property and consumer goods to further their criminal activities and increase their personal wealth. The government believes such people should not be allowed to retain their illegally obtained goods. Therefore, the *Psychoactive Substance Control Bill* coupled with the *Proceeds of Crime Legislation* (money laundering and property purchased with drug money) strikes at the heart of criminal enterprises. Together they will enable the courts to justly strip criminals of profits and property illegally amassed through psychoactive offences.

Anabolic steroids have also become a pressing issue. The Dubin Inquiry brought to light just how prevalent steroid abuse is in Canada. Steroids are not just being used by international competitors. Reportedly, even recreational athletes---adolescents and adults alike---use steroids in an effort to improve their physique. The recent amendments to the *Food and Drugs Act* which classify 45 anabolic-androgenic steroids as controlled drugs will be encompassed by the *Psychoactive* Substance Control Bill. This will result in additional controls over the sale of these drugs.

The trends in the illegal distribution and use of psychoactive substances change rapidly. The legislation is designed to meet current challenges, while remaining flexible enough to adapt to future needs.

The Bill consolidates current drug legislation in the *Narcotic Control Act* and Parts III and IV of the *Food and Drugs Act* and extends the range of control and penalties to deal with emerging drug problems. The Bill provides effective enforcement that is consistent with the *Charter of Rights and Freedoms*. It introduces practical, streamlined regulatory procedures for the distribution and use of drugs. Furthermore, it gives the courts the power to make sure those who commit drug-related offences forfeit all profits from their illegal activities.

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Issues

ANABOLIC STEROIDS

Introduction

At the Summer Olympics in Seoul in 1988, Ben Johnson won the gold medal in the 100-metre sprint event. Just days later, he was stripped of his medal and his title as "the fastest man in the world" when he tested positive for the use of anabolic steroids. A commission of inquiry was called to investigate the illegal use of anabolic steroids in Canada, and on June 27, 1990, the Dubin Inquiry report was tabled in the House of Commons.
The Commission found:

> *"a widespread, thriving black market in anabolic steroids ... dealers operate in the knowledge that the current regulatory controls are inadequate and the penalties insignificant. The abuse has spread beyond high level sport into the gyms and high school locker rooms of the country, putting the health of athletes, recreational sports people, and high school children alike at risk."*

Studies in the United States and Canada have revealed that the steroid problem is not confined to the high-stakes arena of international competition. Some high school athletes, among them football players, abuse steroids to get athletic scholarships or to make teams. Amateur athletes may use steroids to help them recover from injuries or to get into shape faster for competitions. Also, there is evidence that an increasing number of recreational athletes, adolescents and adults alike, use steroids to improve their physical appearance.

Canada

Legitimate use of anabolic steroids

Anabolic steroids imitate the actions of testosterone, a natural human hormone in the body. Anabolic steroids are indicated for veterinary use, to promote rapid growth of muscle tissue in animals. In humans, anabolic steroids are used to treat certain hormonal deficiencies, such as abnormally short stature and delayed puberty in males. They are also used to treat certain types of breast cancer, and anaemia. The doses must be carefully monitored, however, in order to prevent hazardous side effects of the drugs from occurring. These side effects can include blood-filled cysts in the liver and spleen, liver tumours, and blood lipid changes which can lead to heart disease.

Illegitimate use of anabolic steroids

Anabolic steroids have been used as performance aids in sports since the late 1950s, when Soviet athletes used them to build muscle. Since then, their use has spread in competitive and recreational athletics. Anabolic steroids are used most often in sports which involve short bursts of strength, such as weight-lifting, football, sprinting, wrestling, and power-throwing (shot and discus). They are also used by competitive and recreational body-builders of all ages. Often, these athletes practice "stacking"; taking several different kinds of steroids at up to 100 times the prescribed doses. In addition, many anabolic steroids are not meant to be used by humans in any quantity such as those used in veterinary medicine. Anabolic steroids produced by clandestine laboratories may not work, or they may have some impurities in them which could cause major health hazards.

Side effects of anabolic steroid abuse

Even taken in small doses for legitimate medical purposes, anabolic steroids can cause serious side effects. At doses higher than the therapeutic levels, the side effects are more severe and more obvious. Large doses of anabolic steroids taken over an extended period of time may cause personality changes. These can range from increased aggressiveness, sex drive, and feelings of euphoria to violent behaviour and psychosis. In women, anabolic steroid use may cause deepening of the voice, excessive growth of facial or body hair, male pattern baldness, and menstrual irregularities. In men, atrophy of the testicles, painful urination, acne, and breast development may occur. In adolescent users of both sexes, fusion of the long bones may occur, resulting in stunted growth. Long term users may experience muscle cramps, bone pain, nausea or vomiting, and impotence. Potentially life-threatening side effects of anabolic steroid abuse may include increased cholesterol levels, high blood pressure, heart disease, kidney disease, liver disease or tumours, and blood poisoning from injections. In addition, anabolic steroid users often take other drugs to counter the more noticeable side effects. It is unknown how some of these drugs interact with steroids in the human body, and they often produce side effects themselves.

Why anabolic steroid abuse is a problem

Information from various law enforcement agencies suggests that most of the anabolic steroids used by athletes are not prescribed by physicians. The majority of these drugs are diverted from legitimate companies and then illegally imported and/or sold , or they are obtained from other athletes who have access to them while competing in foreign countries where they are readily available. Often, the drugs are of inferior quality to begin with or have been adulterated before being sold. The mixtures sold on the street may contain no anabolic steroids at all. These substances could pose unknown health risks, particularly if injected.

Dealers have, until recently, been able to sell anabolic steroids at up to twenty times their prescription value with little risk of getting caught. Currently some anabolic steroids may be sold with little restriction provided that they are labelled for veterinary or agricultural use or in a form unsuitable for human use. There were no penalties for possession of anabolic steroids or for wholesale distribution. The penalties for trafficking in sex hormones (including steroids) for human use were low enough that the profits exceeded the risks.

Conclusion - what is being done about anabolic steroid abuse

Amendments to the *Food and Drugs Act* and the *Food and Drug Regulations* have resulted in 44 anabolic-androgenic steroids and their derivatives being classified as controlled drugs. This means that these drugs will only be available through licensed dealers, pharmacists, and medical practitioners for medical and scientific purposes. People doing research involving such steroids will be required to have authorization to purchase them from licensed dealers. Prison sentences of up to ten years will be imposed on those illegally producing, selling, or importing anabolic-androgenic steroids. In addition, the listed steroids will be subject to import, manufacturing and distribution controls. It is hoped that these measures will prevent much of the uncontrolled trade in steroids that previously occurred.

Hormonal implants for veterinary use will be exempted from the new regulation because of their low risk of abuse and their large use in the meat producing industry.

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Issues

REDUCING THE RISK OF LISTERIA CONTAMINATION

Listeria monocytogenes is a widespread environmental microbial contaminant which has been found in soil, vegetation, water, sewage, fodder, food and the feces of humans and animals. Some studies suggest that humans can carry the microorganism without harmful effects or illnesses. However, *Listeria* can cause a disease known as listeriosis which in humans can range from a mild flu-like illness or stomach upset to a rare but serious blood poisoning and brain infection. The overall mortality rate ranges from 13 to 34 per cent.

What is known about *Listeria*

Listeria was identified as a pathogen (a disease-causing agent) in the early 1920s. However, it is only in the past decade that scientists have determined that *Listeria* can cause illness in people who consume contaminated foods.

We now know that *Listeria* can be found in a variety of dairy products, leafy vegetables, fish and meat products. Unlike most other bacteria, *Listeria* can survive and sometimes grow on foods being stored in the refrigerator. Moreover, food contaminated with *Listeria* looks, smells and tastes normal. While it is known to be more resistant to heat than most other microbial food contaminants, *Listeria* can be killed by normal cooking procedures.

Canada

Listeriosis: rare but serious

While humans may carry *Listeria monocytogenes* in their intestines, few people actually develop listeriosis. In recent years, 40-50 cases have been recorded annually in Canada. Worldwide, large outbreaks of listeriosis have been documented in Nova Scotia (1981), Boston (1983), Los Angeles (1985), Switzerland (1983-1987), and the United Kingdom (1987-1989). A total of at least 110 people died from listeriosis during these outbreaks. Health authorities identified coleslaw, pasteurized milk (recontaminated following the pasteurization process), Mexican-style soft cheese, Swiss soft cheese and liver pâté as the sources of infection. Other foods which have been linked to small numbers of human listeriosis cases include fermented sausages, turkey frankfurters, chicken and shrimp.

Symptoms of listeriosis usually include vomiting, nausea, cramps, diarrhoea, headache, constipation and persistent fever. These symptoms may be followed by an infection of the brain and/or blood poisoning, either of which can result in death.

Those at particular risk include pregnant women and their unborn children, cancer patients undergoing chemotherapy, transplant patients, alcoholics, drug abusers, diabetics, AIDS patients and people over 60 years of age (the risk increases with age). If a pregnant woman develops listeriosis during the first three months of pregnancy she may suffer a miscarriage. Infections developed later in the pregnancy can result in stillbirth or an acutely ill newborn. In these latter instances, early recognition of the disease is critical for successful treatment.

Minimizing food contamination

Although it is not certain that all outbreaks of listeriosis are linked to contaminated food, the majority of cases are thought to be, and, as such, minimizing food contamination is an essential safeguard. *Listeria* contamination can be minimized through good hygienic practices in food manufacturing plants, retail establishments (grocers and restaurants) and in private kitchens.

It is recognized that processed food can be contaminated either by raw foods or more specifically, the processing environment. Food plant sanitation is therefore of great importance. The Canadian food industry follows guidelines on sanitation in order to minimize all potential sources of food contamination which may stem from sources such as drains, cracks in floors and walls, and condensation from air cooling systems. Many food processing plants carry out regular environmental sampling and pay increased attention to sanitation practices in areas where *Listeria* is found.

In the kitchen, all surfaces used for food preparation should be cleaned and sanitized after each use with a household bleach or other disinfectant. Cross-contamination (the spread of the microorganism from one food to another) of cooked products can be avoided by cleaning knives, cutting boards and utensils after contact with raw foods. Vegetables should be thoroughly cleaned before eating, especially those grown in uncomposted manure, which has been shown to be a source of *Listeria*. Foods which have been adequately pasteurized, cooked or pickled, and then immediately packaged under hygienic conditions or consumed, may be considered free of *Listeria*.

Government controls

The Departments of Health and Welfare, Agriculture and Fisheries and Oceans inspect domestic and imported foods for the presence of *Listeria*. They also monitor for the presence of the microorganism in food plants. The Health Protection Branch of Health and Welfare Canada monitors foods likely to contain *Listeria* and other pathogens, taking prompt regulatory action when positive results are obtained. If warranted, implicated foods are recalled from the market. In addition, the federal government reviews and improves good manufacturing practices, and follows-up with frequent inspections and analysis in food plants.

Health and Welfare Canada also briefs the medical community, other public health officials, the food industry and the public on this issue.

Conclusion

Because *Listeria* is so widespread in the environment and can survive for long periods of time in nature, it is extremely difficult, if not impossible to eliminate the organism from all foods. Nevertheless, precautions can and should be taken to reduce the risk of disease.

To minimize infection for those particularly at risk, it is recommended that pregnant women and others who are susceptible to infection avoid eating soft cheese and pâté. These foods have been previously involved in large listeriosis outbreaks and are most likely to promote growth of the microorganism. As a general guideline, consumers can avoid foods which may contain *Listeria*, such as raw milk, undercooked poultry, or raw or very rare fish or meat. Make sure that all foods are adequately cooked, and that leftover and precooked foods are heated until uniformly piping hot. Cut-up vegetables, such as those used in the preparation of salads, should be thoroughly washed and then consumed within several days.

It is only by everyone playing their part: industry, government and the consumer that the impact of listeriosis can be minimized.

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June 24, 1992

Reducing the Risk of Listeria Contamination is one of a series of Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups.

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Health and Welfare Canada
Santé et Bien-être social Canada

Health Protection Branch

Issues

WATER CHLORINATION

Introduction

Over the past few years, public awareness about chemical contamination of drinking water has grown. For the most part, Canadian drinking water supplies are free of disease causing organisms found in many developing countries.

Because it is a powerful solvent, water dissolves a bit of almost everything it comes in contact with. It can pick up beneficial chemicals in the earth such as calcium, magnesium, carbonates, sulphates, and other minerals which give water a pleasing taste and beneficial health qualities. However, it also dissolves harmful chemicals that may occur naturally in the environment like arsenic, asbestos and radon. Water can also pick up man-made industrial chemicals such as benzene and tetrachloroethylene. Still other contaminants come from the water treatment and distribution systems, such as trihalomethanes, lead and copper.

Trihalomethanes (THMs) are chemical compounds that form in drinking water when organic matter in untreated water supplies is **chlorinated** to kill disease-causing micro-organisms. The most common THMs in drinking water are chloroform, bromodichloromethane, chlorodibromomethane and bromoform.

Both where and when the water is chlorinated can affect the level of THMs in drinking water. Reduced concentrations of materials that promote THM production, and reduced chlorine usage in the winter, lead to lower THM levels at this time of year. Where the water comes from is also important. In wells and large lakes, settling removes some organic matter and this results in lower levels of THMs after chlorination. Water taken from surface water sources (rivers, for example) usually has higher levels of organic matter and this will result in higher levels of THMs.

Canada

Health Effects

Animals subjected to extremely high levels of these compounds have shown an increased incidence of cancer. There is also weak evidence in human population studies that chlorinated drinking water is associated with a slight increase in certain types of cancer. However, careful evaluation of all the evidence shows that the concentrations of THMs in Canadian drinking water are commonly so low that there is usually negligible risk to human health.

Risks and Benefits

The benefits of chlorinating our drinking water are much greater than the small risks of health effects from THMs. The introduction of water treatment, particularly chlorination at the turn of the century, dramatically reduced the incidence of water-borne diseases such as cholera and typhoid fever.

Although other disinfectants are available, chlorine continues to be the choice of water treatment experts. When used with modern water filtration practices, chlorine is effective against virtually all infective agents (i.e., bacteria, viruses, protozoa). It is easy to apply, and most importantly, small amounts of chlorine remain in the water and continue to disinfect throughout the distribution system, unless intentionally removed using the measures described below. This ensures that the water remains free of microbial contamination on its journey from the treatment plant to your tap.

A number of cities use ozonation at some stages of treatment to improve the purification process and to reduce THM formation. However, because ozone breaks down quickly, it is still necessary to add small amounts of chlorine to the water to ensure continued disinfection.

What the Consumer Can Do

Drinking water that already satisfies the Guidelines for Canadian Drinking Water Quality does not need additional treatment for health-related reasons. Nevertheless, if the consumer wishes to remove THMs at home, this can be easily done. The consumer can reduce THM levels simply by aerating the water in a blender, boiling it or storing it in the refrigerator for 24 hours. Water treatment devices containing activated carbon also remove THMs.

Guidelines for Canadian Drinking Water Quality

Although the availability of safe drinking water is the responsibility of both the federal and provincial governments, each recognizes the need for a consistent approach to improving drinking water quality. The *Guidelines for Canadian Drinking Water Quality*, which were first published in 1968, are subject to constant review and revision to take into account new data on contaminants in drinking water. The Guidelines are designed to ensure Canadians have access to wholesome and safe drinking water. The most recent edition of the *Guidelines* was published in 1989.

Conclusions

Over the past 10 years, improved analytical methods have enabled us to detect chemicals at extremely low levels (parts per trillion or even per quadrillion). The presence of these low levels doesn't necessarily mean there is an increased risk to health.

As part of *Canada's Green Plan for a healthy environment*, we are working on a new Drinking Water Safety Act to institute standards that will further reduce health risks through the development of:

- regulations establishing mandatory standards for drinking water quality within the federal jurisdiction,
- quality standards for chemicals used in water, materials used in contact with water, and point-of-use water treatment devices, and
- research on the health effects of drinking water.

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Health and Welfare Canada
Santé et Bien-être social Canada

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Issues

CANADIAN HIV TRIALS NETWORK

Since 1982, over 4900 cases of AIDS have been reported to Health and Welfare Canada. Almost half the Canadians with AIDS have now died, primarily from the opportunistic infections.

A key element of the strategy for prolonging the lives of people with AIDS involves the use of medication to treat opportunistic infections. However, before AIDS, many of the infections now commonly seen in people with AIDS were extremely rare and as a result, few treatments were available. Most of the newly discovered drugs currently used are experimental drugs and have yet to be approved. It is therefore important for doctors who treat people with AIDS to investigate the proper use of known medications and to participate in clinical trials of new drugs.

The Canadian HIV Trials Network was established in April, 1990 by the Minister of Health and Welfare Canada. The purpose of this network is to facilitate the timely and efficient implementation of clinical trials of HIV and AIDS experimental drugs on a national basis.

The objectives of the network are:

- to create a well-organized infrastructure to support the implementation of clinical trials of HIV therapeutic agents;
- to foster collaborative research on an international basis, particularly with counterparts in the United States;
- to ensure access to trials on a national basis, and
- to improve communication among researchers, clinicians, their patients and the pharmaceutical industry.

In order to fulfil these goals, the Minister of Health and Welfare Canada has signed a contribution arrangement with the University of British Columbia/St. Paul's Hospital in Vancouver, B.C. The University of British Columbia (UBC) has appointed Dr. John Ruedy as the Director of the Canadian HIV Trials Network. Under Dr. Ruedy's direction, the network's National Coordination Centre is responsible for organizing the activities of the Canadian HIV Trials Network. The organization of the network is illustrated in figure 1.

The tasks of the National Coordination Centre include co–ordinating submissions and developing procedures for the acceptance of trials, as well as administering the budget. In addition, the centre will facilitate communication among researchers, clinicians, the HIV infected persons, trial sponsors, laboratories, governments and the general public regarding clinical trials within the network.

The network's communications activities, all of which are produced in both English and French, include a general information brochure; a news bulletin called the "Network Update"; information materials regarding applications to the network, and ongoing liaison with key agencies. For example, the National Coordination Centre organized a workshop on possible treatments for Microbacterium avium intracellular complex, and a second workshop on viral isolation. It will develop an inventory of current laboratory services across Canada. A ten–minute videotape about the network has been produced in both French and English.

On request, the network's Data and Analysis Centre provides data collection, coordination, validation analysis, advice and consultation services regarding protocols. It has purchased all necessary computer equipment and software to operate the network. The distribution of modems, software and hardware to the participants is now complete, and the centre has provided a training program for data entry personnel.

The National Coordination Centre is in communication with the hubs of clinical trial activity, called Regional Trial Units. There are five Regional Trial Units located in Quebec, Ontario, the Prairies, the Pacific and the Atlantic regions. Under the Regional Directors, the Regional Trial Units enrol patients for clinical trials. Registration may occur directly at the site of the Regional Trial Unit, or at satellite locations. The Regional Director is responsible for giving the network a visible presence in each region by providing a facility to enrol patients in network trials; by encouraging new research; by maintaining lines of communication and by participating in national network committees and activities.

A process has been designed for the evaluation of a drug protocol as a candidate in the Canadian HIV Trials Network, based on fairness, scientific integrity and optimum consideration of patients' needs. A principal investigator or pharmaceutical company wishing to utilize the resources of the network must apply to the National Coordination Centre, using the standard forms developed by the network.

The applications are first reviewed by the Scientific Review Committee for scientific integrity. The committee is composed of scientists and clinicians, and chaired by Dr. Mark Wainberg. Once the Scientific Review Committee has made a decision regarding a protocol, then the National Steering Committee reviews the broader implications (such as network resources) of the protocol submissions. The committee is composed of scientists, ethicists, community physicians, persons affected by HIV and a representative of the Pharmaceutical Manufacturers Association of Canada. Dr. John Ruedy is the committee Chairman and National Director of the Network. The Safety and Efficacy Committee, chaired by Dr. David Roy, is also involved in the process by monitoring the safety and efficacy aspects of ongoing trials. The committee is composed of experts in HIV clinical care, research design, biostatistics, ethics and law.

During its first year of operation, the Scientific Review and the National Steering Committees, 26 trial applications have been reviewed. Of these, ten are actively being implemented. They include:

- Multi-centre Canadian Azidothymidine Trial (MCAT);
- double blind comparison of ddI and Zidovudine (ZDV);
- comparative study of two doses of Intron-A for AIDS-related Kaposi's Sarcoma;
- double blind comparison of Acemannan vs. Placebo in patients on Zidovudine;
- Rifabutin for the prevention of MAC in AIDS;
- Itraconazole vs. Ketoconazole for Oropharyngeal and/or Oesophageal Candidiasis;
- chemotherapy treatment of HIV-related non-Hodgkin's Lymphoma;
- Sodium Ditiocarb
- a combination chemotherapy of MAC infections in AIDS
- Clindamycin with Primaquine vs. Trimethoprim-Sulfamethoxazole for the treatment of Pneumocystis Carinii Pneumonia

For further information, loan of the video or copies of the quarterly newsletter, please contact:

The Canadian HIV Trial Network
National Coordination Centre
1033 Davie Street
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Vancouver, British Columbia
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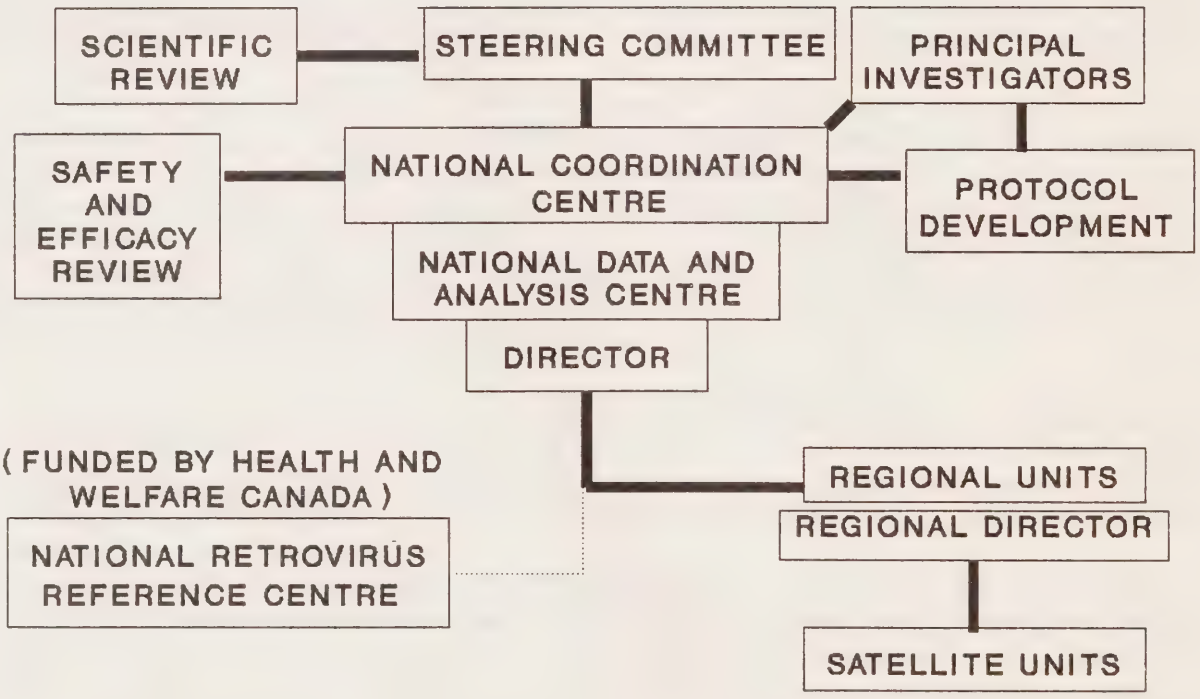
Canadian HIV Trials Network is one of Health Protection Branch Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media and special interest groups interested in health protection in Canada.

Disponible en français.

FIGURE 1

HIV CLINICAL TRIAL NETWORK



Health and Welfare Canada
Santé et Bien-être social Canada

Health Protection Branch

ISSUES

DEET AND PERSONAL INSECT REPELLENTS

Introduction

Over the past 30 years, we've used personal insect repellents to ward off biting insects like mosquitos, black flies and ticks.

Personal insect repellent products can contain several different active ingredients. Among these are:

- DEET (N,N-diethyl-m-toluamide)
- oil of citronella
- dimethyl phthalate (DMP)
- oil of lavender
- MGK Repellent 264 (n-octyl bicycloheptene dicarboximide)
- MGK Repellent 326 (di-n-propyl isocinchomeronate)

These products come in many forms: liquids, lotions, pastes, solids, sprays, and impregnated fabrics such as towelettes. Individual products may contain more than one active ingredient at various concentrations up to 100 per cent. Most commonly available products contain DEET.

Do personal insect repellents pose any risks to our health?

Over the years, there have been some cases of reactions to personal insect repellents. Most often, these involved eye or skin irritation and possible allergic reactions. Although these incidents are relatively uncommon, most of the reported cases involved children. This may indicate that children are more likely to be accidentally or over-exposed to repellents, and may be more sensitive to the effects of these chemicals.

Canada

There have been very rare occurrences, mostly in children, of neurological effects following skin applications. The symptoms of neurological reaction include lethargy, abnormal muscle movements, behavioral changes and seizures.

Although most reported cases involved DEET, this may reflect that DEET is the most widely used product rather than that it is more toxic compared to other insect repellents.

The most widely studied personal insect repellent is DEET. In laboratory animal tests, DEET has a relatively low toxicity but it can cause severe eye irritation. DEET is easily absorbed through the skin; however, it does not appear to build up in the body and it is eliminated rapidly. No other significant adverse health effects have been identified.

Can I use these products?

As with any drug or chemical, all personal insect repellent products should be used with care and common sense. Safe application and storage practices can reduce the potential for accidental exposures or harmful reactions.

Here are some precautionary measures you can take:

- Keep all insect repellent containers out of the reach of children.
- Always read the entire label before using.
- Use only personal insect repellents that are registered in Canada. They have a registration number and are labelled as insect repellents for use on humans.
- Never use a product labelled as an *insecticide* on your body.
- Two personal insect repellent ingredients have recently had their registrations cancelled in Canada - **MGK Repellent 11** (2,3,4,5-bis(butylene)tetrahydro-2-furfural) and **EHX** (2-ethyl-1,3-hexanediol). These products should not be used. Check the "Guarantee" statement to be sure these ingredients are not in the products you are using. Return any product that does contain these ingredients to the retail outlet or dispose in your local municipal hazardous waste disposal site.
- Try not to use personal insect repellents on children under two years old.

- Children may be more sensitive and at a higher risk of harmful reactions. Always supervise application of insect repellent on children. Use the least concentrated products and be extra careful to avoid contact with the eyes. Avoid spraying children's hands with repellent to reduce the chance of getting the repellent in their eyes and mouths.

- Apply the repellent sparingly, and only when you really need protection. It should only be used on exposed skin, and over clothing. Do not use under clothing.

- Wash treated skin with soap and water when you return indoors or when protection is no longer needed.

- Do not get in eyes and avoid breathing spray mists. If you do get repellent in your eyes, rinse immediately with water.

- Do not use the repellent on open wounds, nor if your skin is irritated or sunburned.

- Some personal insect repellent products contain a skin lotion or sunscreen. Use these products only for their purpose as an *insect repellent* and according to the safe practices listed here.

- To see if you are sensitive to a particular product, apply the product to a small area of skin on your arm before general use.

- Stop using the product immediately if you experience any reactions. These may include skin or eye irritation, allergic reactions, or nervous system effects including behavioral changes or abnormal movements. Seek medical attention if symptoms persist or are severe and take the product container with you.

What does Health and Welfare Canada do to make sure these products are safe?

In Canada, all personal insect repellents must be registered under the Pest Control Products Act (PCP Act) administered by Agriculture Canada. The Health Protection Branch of Health and Welfare Canada provides advice on the toxicity of the ingredients and how to use them safely.

We are concerned about personal insect repellents because of the extent of human exposure and the potential for the misuse of these products. We also recognize the need for newer studies that employ modern methods and standards.

For example, recent animal toxicology studies on two insect repellents, MGK Repellent 11 (2,3,4,5-bis(butylene)tetrahydro-2-furfural) and EHX (2-ethyl-1,3-hexanediol), showed possible effects on reproduction and fetal development. As a result, the registration of these two ingredients were cancelled for sale and use by Agriculture Canada.

In 1990, Agriculture Canada announced its plans to re-evaluate all personal insect repellents. As a result of that initiative, new information has been developed and additional studies are underway which will allow us to use personal insect repellents more effectively and safely.

To guarantee that Canadians are not exposed to unavoidable health risks, we are continuing to evaluate the safety of personal insect repellents and to assess the significance of reported health reactions.

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July 2, 1992

DEET and Personal Insect Repellents is one of a series of **Issues** produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

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For additional copies of **Issues** contact:
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Santé et Bien-être social Canada
Health and Welfare Canada

Direction générale de la protection de la santé

Actualités

LE DEET ET LES INSECTIFUGES PERSONNELS

Introduction

Depuis 30 ans, nous utilisons les insectifuges personnels pour prévenir les piqûres d'insectes comme les moustiques, les mouches noires et les tiques.

Les produits insectifuges personnels peuvent contenir plusieurs ingrédients actifs différents parmi lesquels figurent :

- le DEET (N,N-diéthyl-m-toluamide),
- l'essence de citronnelle,
- le phtalate de diméthyle, (DMP)
- l'essence de lavande,
- le MGK Repellent 264 (n-octyl-bicycloheptène-dicarboximide),
- le MGK Repellent 326 (isocinchoméronate de di-n-propyle).

Ces produits sont commercialisés sous différentes formes : liquides, lotions, pâtes, solides, aérosols et tampons imprégnés. Les différents produits peuvent contenir plus d'un ingrédient actif à des concentrations variables pouvant atteindre 100 pour cent. La plupart des produits les plus répandus sur le marché contiennent du DEET.

Canada

Est-ce que les insectifuges personnels constituent un risque pour la santé?

Au cours des années, on a signalé certaines réactions à l'égard des insectifuges personnels. Le plus souvent, il s'agissait d'une irritation des yeux ou de la peau et de réactions allergiques possibles. Bien que les incidents de ce genre soient peu fréquents, les cas de réaction ont été signalés surtout chez les enfants. Cette situation pourrait indiquer que les enfants sont vraisemblablement plus sujets à une exposition accidentelle ou à une exposition excessive aux insectifuges et qu'ils pourraient être plus sensibles aux effets de ces produits chimiques.

On a enregistré quelques très rares cas d'effets neurologiques consécutifs à l'application des insectifuges sur la peau, la plupart du temps chez des enfants. Les symptômes neurologiques comprennent la léthargie, des mouvements musculaires anormaux, des changements de comportement et des convulsions.

Bien que le DEET ait été en cause dans la plupart des cas signalés, cela pourrait être attribuable au fait qu'il s'agit du produit le plus répandu et non au fait qu'il s'agit d'un produit plus toxique que les autres insectifuges.

Le DEET est l'insectifuge personnel qui a été le plus étudié. Dans les tests effectués chez des animaux de laboratoire, on a constaté que sa toxicité est relativement faible, mais qu'il peut causer une grave irritation oculaire. Le DEET est facilement absorbé à travers la peau; cependant, il ne semble pas s'accumuler dans l'organisme et il est éliminé rapidement. Aucun autre effet défavorable important sur la santé n'a été décelé.

Puis-je utiliser ces produits?

Comme c'est le cas pour n'importe quel médicament ou produit chimique, on doit faire preuve de prudence et de jugement lorsqu'on utilise les insectifuges personnels. Le respect des règles de sécurité en matière d'application et de conservation des insectifuges peut réduire les risques d'exposition accidentelle et de réactions défavorables.

Voici certaines précautions que vous pouvez prendre :

- Garder les contenants d'insectifuges dans un endroit hors de la portée des enfants.

- Toujours lire l'étiquette en entier avant l'emploi.

- N'utiliser que des insectifuges personnels homologués au Canada. Ils possèdent un numéro d'enregistrement et sont étiquetés comme insectifuges pour usage chez les humains.

- Ne jamais appliquer sur votre corps un produit étiqueté comme étant un *insecticide*.

- Deux ingrédients pour insectifuges personnels se sont vu retirer leur homologation au Canada récemment, le **MGK Repellent 11** (ou 2,3,4,5-bis(butylène)tétrahydro-2-furfural) et l'**EHX** (ou 2-éthyl-1,3-hexanediol). Ces produits ne doivent pas être utilisés. Vérifier l'étiquette pour vous assurer que ces ingrédients ne sont pas présents dans les produits que vous utilisez. Il faut retourner au détaillant tous les produits qui contiennent ces ingrédients ou encore, faire en sorte qu'ils soit éliminés dans le lieu d'élimination des déchets dangereux de votre municipalité.

- Essayer, dans toute la mesure du possible, de ne pas appliquer d'insectifuges personnels sur des enfants âgés de moins de deux ans.

- Les enfants peuvent être plus sensibles et être exposés à un risque plus grand de réactions défavorables. Toujours surveiller l'application des insectifuges chez les enfants. Utiliser les produits les moins concentrés et faire très attention pour éviter le contact avec les yeux. Éviter d'appliquer le produit sur les mains des enfants pour réduire la possibilité que l'insectifuge entre en contact avec les yeux ou la bouche de l'enfant.

- Appliquer l'insectifuge avec parcimonie et uniquement lorsque le besoin de protection est réel. L'insecticide ne doit être utilisé que sur la peau exposée ou sur les vêtements. Ne pas en appliquer sur la peau déjà recouverte par des vêtements.

- Laver la peau traitée à l'eau et au savon lorsque vous rentrez à l'intérieur ou que la protection n'est plus nécessaire.

- Ne pas inhaler les insectifuges en aérosol et éviter le contact avec les yeux. En cas de contact avec les yeux, rincer les yeux immédiatement à l'eau.

- Ne pas appliquer d'insectifuges sur les blessures à vif, ni sur la peau irritée, ni sur une peau brûlée par le soleil.

- Certains insectifuges personnels contiennent une lotion cutanée ou un écran solaire. N'utiliser ces produits qu'en fonction de leur usage principal d'*insectifuge* et en respectant les règles de sécurité décrites ici.

- Pour vérifier si vous êtes sensible à un produit particulier, appliquer le produit sur une surface restreinte du bras avant de passer à une application plus générale.

- Cesser immédiatement d'utiliser le produit dès les premiers signes de réaction. Il peut s'agir d'une irritation cutanée ou oculaire, de réactions allergiques ou d'effets sur le système nerveux comme des changements de comportement ou des mouvements anormaux. En cas de symptômes graves ou persistants, consulter un médecin en prenant soin d'apporter avec vous le contenant du produit.

Que fait Santé et Bien-être social Canada pour s'assurer que ces produits sont sans danger?

Au Canada, tous les insectifuges personnels doivent être homologués en vertu de la Loi sur les produits antiparasitaires administrée par Agriculture Canada. La Direction générale de la protection de la santé de Santé et Bien-être social Canada fournit des conseils sur la toxicité des ingrédients et sur la façon de les utiliser d'une manière sécuritaire.

Les insectifuges personnels nous préoccupent en raison de l'exposition humaine étendue à laquelle ils donnent lieu et de la possibilité qu'ils soient mal utilisés. Nous reconnaissons également qu'il serait nécessaire d'effectuer de nouvelles études fondées sur des méthodes et des normes plus modernes.

Par exemple, des études toxicologiques plus récentes effectuées sur des animaux et portant sur deux insectifuges, le MGK Repellent 11 (ou 2,3,4,5-bis(butylène)tétrahydro-2-furfural) et l'EHX (ou 2-éthyl-1,3-hexanediol), ont révélé la possibilité d'effets sur la reproduction et sur le développement foetal. En conséquence, Agriculture Canada a retiré l'homologation qui permettait la vente et l'utilisation de ces deux ingrédients.

En 1990, Agriculture Canada a annoncé son intention de réévaluer tous les insectifuges personnels. Suite à cette annonce, nous avons obtenu de nouvelles données et des études sont en cours qui nous permettront d'utiliser les insectifuges personnels d'une manière plus efficace et plus sûre.

Pour nous assurer que les Canadiens ne sont pas exposés à des risques sanitaires évitables, nous continuons à évaluer l'innocuité de tous les insectifuges personnels ainsi que l'importance des réactions signalées.

le 2 juillet, 1992

Le Deet et les insectigues personnels fait partie de la série Actualités, produite par la Direction générale de la protection de la santé de Santé et Bien-être social Canada à l'intention du grand public, des médias et des groupes qui s'intéressent à la protection de la santé au Canada.

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Issues

PREVENTING SKIN CANCER

-- It's Up To You

Introduction

The skin is the largest organ in our body. It is essential to our survival. Our skin protects us from dehydration, from natural elements such as the sun and bacterial infections, and from man-made aggressors such as consumer products and pollution.

Our skin is constantly under attack and adapts to a variety of stresses. It has several layers of specialized tissue. The outermost skin layer matures quickly and sheds continuously. Skin renews itself every four to six weeks in people who have no skin disease and haven't been sunburned.

However, the skin's ability to protect us does have limits. Like our other organs, the skin undergoes many changes in response to internal or external conditions. Sometimes the changes are not repaired and we become ill. This is what happens with skin cancer.

Are there different types of skin cancer?

Yes. Skin cancer, the most frequent of all cancers, consists of three main varieties: basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Most skin cancers occur late in life, though some occur in early-to-mid life. Basal and squamous cell carcinoma develop on skin that is exposed repeatedly to the sun, while malignant melanoma may develop almost anywhere on the body.

Canada

Most skin cancers occur in white people on areas of the body that have been exposed to the sun for a large part of their lives -- usually on the face, neck and hands. These cancers appear on the skin surface in later years and progress slowly. They rarely cause death, as they usually don't spread to other parts of the body. These skin cancers are easily removed by local surgery.

Malignant melanomas account for only one or two percent of all skin cancers, but they are the type most likely to be fatal. Unlike other skin cancers, they occur earlier in life and progress rapidly. Although the rate of skin cancer in Canada has remained fairly constant over the past 30 years, and the number of malignant melanomas in Canada is still relatively low, there has been a recent increase in the incidence of malignant melanoma. The only other type of cancer with a more rapid annual increase of new cases is lung cancer in women.

What causes skin cancer?

One of the main causes of skin cancer is exposure to UV rays. Ultraviolet light is invisible to the naked eye and is given off by the sun or certain kinds of lamps. Most often, skin cancer is the result of over-exposure to the sun. In some cases, UV rays directly cause skin cancer. In other cases, the action of the ultraviolet rays is indirect -- it damages the immune mechanisms in the skin and in the rest of the body, preventing the skin from repairing itself.

Many studies of skin cancer, especially of malignant melanoma, show individual intolerance to sun exposure. People who have tanned poorly and/or suffered severe and frequent sunburns during their childhood or throughout their lives are at increased risk. Fair skin is more vulnerable because it contains very little pigment to decrease penetration by ultraviolet rays. Most patients with certain types of malignant melanoma have fair or freckled skin, blue eyes and light-coloured or reddish hair -- features closely associated with sun intolerance.

Are children more vulnerable to the sun?

Yes. A child's skin is thinner, more sensitive and therefore less protected against the penetration of ultraviolet rays. Infants are particularly vulnerable. Even a brief exposure (as little as 10-15 minutes) to the summer sun between 10 a.m. and 3 p.m. can result in serious burns in children. And there is evidence that even a single sunburn in childhood may increase the risk of developing skin cancer later in life. All sunburns should be avoided, but particularly by children.

How can I protect myself?

Most people can prevent skin cancer by simply not over-exposing themselves to the sun and to ultraviolet lamps, such as sunlamps. A suntan and a sunburn are two quite distinct reactions, but both are evidence of skin injury. When you have a tan, ultraviolet rays have darkened the pigment in your skin called melanin. This darkened pigment does protect your skin from some further ultraviolet penetration, but not enough. It also shows that skin damage has already occurred.

You don't need to get a sunburn to tan, and you don't need a suntan to be healthy.

To avoid the harmful effects of ultraviolet rays:

- Select shaded areas for outdoor activities;
- Wear a broad-brimmed hat, tightly woven clothing, a long-sleeved shirt, long pants and gloves when you have to spend long periods in the sun;
- If you can't cover up, use a sunscreen lotion which has a Sun Protection Factor (SPF) of at least 15. Make sure it has both UVA and UVB protection. Re-apply it every two hours, as well as after swimming;
- Avoid tanning altogether or at least avoid tanning for long periods, particularly between 10 a.m. and 3 p.m. during the summer months;
- Avoid using sun lamps;
- Be careful of medication. Certain prescriptions such as tetracycline can make your skin more sensitive to UV rays. Consult your doctor if you have any questions about your medication.
- Protect your eyes as well as your skin from ultraviolet damage. Wear sunglasses that filter out UV rays. Some sunglasses have labels stating the degree of UV protection they provide.

How can I protect my children?

You can protect your children by following these simple precautions:

- Don't let infants or young children play or sleep in the sun in a playpen, carriage, stroller, etc.;

- Don't let young children stay in the sun for long periods, even when wearing a sunscreen;
- If your children have to stay outdoors for a long period, make sure they wear protective clothing, including a hat and sunglasses;
- Get your children used to wearing sunscreen lotion, paying particular attention to the most exposed parts -- the face, neck, shoulders, back, knees and tops of feet;
- Provide teenagers with sunscreen lotion (SPF-15 or higher) if they are going to be outdoors for extended periods during the summer;
- Don't allow children or teenagers to use sunlamps.

How can I detect skin cancer early?

The best way to detect skin cancer early is to examine your skin often and see your doctor if you notice the following:

- Any abnormally dark or discoloured patches or spots;
- Any bleeding, crusting or change in the colour, size or shape of a mole.

Where can I get more information?

The following related publications are available from Health and Welfare Canada:

- The Sun, Your Baby and You: A Parent's Guide to Sun Protection
- Thinning of the Ozone Layer -- The Health Effects (ISSUES EH-92-1E)

Contact your local office of the Canadian Cancer Society for more information on skin cancer.

Additional publications on the ozone layer and UV are available from:
Environment Canada, Enquiry Centre, Ottawa, Ontario K1A 0H3.

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Issues

DEET AND PERSONAL INSECT REPELLENTS

Introduction

Over the past 30 years, we've used personal insect repellents to ward off biting insects like mosquitos, black flies and ticks.

Personal insect repellent products can contain several different active ingredients. Among these are:

- DEET (N,N-diethyl-m-toluamide)
- oil of citronella
- dimethyl phthalate (DMP)
- oil of lavender
- MGK Repellent 264 (n-octyl bicycloheptene dicarboximide)
- MGK Repellent 326 (di-n-propyl isocinchomeronate).

These products come in many forms: liquids, lotions, pastes, solids, sprays, and impregnated fabrics such as towelettes. Individual products may contain more than one active ingredient at various concentrations up to 100 per cent. Most commonly available products contain DEET.

Do personal insect repellents pose any risks to our health?

Over the years, there have been some cases of reactions to personal insect repellents. Most often, these involved eye or skin irritation and possible allergic reactions. Although these incidents are relatively uncommon, most of the reported cases involved children. This may indicate that children are more likely to be accidentally or over-exposed to repellents, and may be more sensitive to the effects of these chemicals.

Canada

There have been very rare occurrences, mostly in children, of neurological effects following skin applications. The symptoms of neurological reaction include lethargy, abnormal muscle movements, behavioral changes and seizures.

Although most reported cases involved DEET, this may reflect that DEET is the most widely used product rather than that it is more toxic compared to other insect repellents.

The most widely studied personal insect repellent is DEET. In laboratory animal tests, DEET has a relatively low toxicity but it can cause severe eye irritation. DEET is easily absorbed through the skin; however, it does not appear to build up in the body and it is eliminated rapidly. No other significant adverse health effects have been identified.

Can I use these products?

As with any drug or chemical, all personal insect repellent products should be used with care and common sense. Safe application and storage practices can reduce the potential for accidental exposures or harmful reactions.

Here are some precautionary measures you can take:

- Keep all insect repellent containers out of the reach of children.
- Always read the entire label before using.
- Use only personal insect repellents that are registered in Canada. They have a registration number and are labelled as insect repellents for use on humans.
- Never use a product labelled as an *insecticide* on your body.
- Two personal insect repellent ingredients have recently had their registrations cancelled in Canada - **MGK Repellent 11** (2,3,4,5-bis(butylene)tetrahydro-2-furfural) and **EHX** (2-ethyl-1,3-hexanediol). These products should not be used. Check the "Guarantee" statement to be sure these ingredients are not in the products you are using. Return any product that does contain these ingredients to the retail outlet or dispose in your local municipal hazardous waste disposal site.
- Try not to use personal insect repellents on children under two years old.

- Children may be more sensitive and at a higher risk of harmful reactions. Always supervise application of insect repellent on children. Use the least concentrated products and be extra careful to avoid contact with the eyes. Avoid spraying children's hands with repellent to reduce the chance of getting the repellent in their eyes and mouths.

- Apply the repellent sparingly, and only when you really need protection. It should only be used on exposed skin, and over clothing. Do not use under clothing.

- Wash treated skin with soap and water when you return indoors or when protection is no longer needed.

- Do not get in eyes and avoid breathing spray mists. If you do get repellent in your eyes, rinse immediately with water.

- Do not use the repellent on open wounds, nor if your skin is irritated or sunburned.

- Some personal insect repellent products contain a skin lotion or sunscreen. Use these products only for their purpose as an *insect repellent* and according to the safe practices listed here.

- To see if you are sensitive to a particular product, apply the product to a small area of skin on your arm before general use.

- Stop using the product immediately if you experience any reactions. These may include skin or eye irritation, allergic reactions, or nervous system effects including behavioral changes or abnormal movements. Seek medical attention if symptoms persist or are severe and take the product container with you.

What does Health and Welfare Canada do to make sure these products are safe?

In Canada, all personal insect repellents must be registered under the Pest Control Products Act (PCP Act) administered by Agriculture Canada. The Health Protection Branch of Health and Welfare Canada provides advice on the toxicity of the ingredients and how to use them safely.

We are concerned about personal insect repellents because of the extent of human exposure and the potential for the misuse of these products. We also recognize the need for newer studies that employ modern methods and standards.

For example, recent animal toxicology studies on two insect repellents, MGK Repellent 11 (2,3,4,5-bis(butylene)tetrahydro-2-furfural) and EHX (2-ethyl-1,3-hexanediol), showed possible effects on reproduction and fetal development. As a result, the registration of these two ingredients were cancelled for sale and use by Agriculture Canada.

In 1990, Agriculture Canada announced its plans to re-evaluate all personal insect repellents. As a result of that initiative, new information has been developed and additional studies are underway which will allow us to use personal insect repellents more effectively and safely.

To guarantee that Canadians are not exposed to unavoidable health risks, we are continuing to evaluate the safety of personal insect repellents and to assess the significance of reported health reactions.

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Issues

ENVIRONMENTAL SENSITIVITIES

"My dear friend," he would say, "I beg you: shall I be causing you much inconvenience if I ask you to take the handkerchief out of your jacket? You know how I can't bear any perfume... the last time you were so good as to come and see me... I was obliged to take the chair you sat in and keep it out in the courtyard for three days."

from *Marcel Proust: His Life and work*. by Leon Pierre-Quint, Peter Lang, 1925

Background

Environmental sensitivities are a medical conundrum of the 20th century. They constitute an illness that in a very real scientific sense seems to defy description or definition. Doctors and scientists have had great difficulty in nailing down precise causes and symptoms or defining a universally accepted clinical description of this condition.

The number of names for these afflictions indicates the confusion this condition causes in the medical world. In a recent report prepared for the New Jersey Department of Health, twenty labels were identified including: multiple chemical sensitivities, universal allergy, 20th century illness, cerebral allergy, environmental maladaptation syndrome, conditioned odour response, immune dysfunction and environmental illness. There are also many similarities to " chronic fatigue syndrome."

Canada

Although environmental sensitivities are often linked to allergies in that affected persons seem to react to unusually small doses of the substance(s) to which they are sensitive, they are unlike traditionally defined allergies in that they do not exert their effects in the same way.

Symptoms and Diagnosis

Part of the difficulty with identifying and treating this illness is that people suffer an array of symptoms. As well, many of these symptoms are subjective, meaning they are not observable.

Generalized anxiety, palpitations, tremor and sweating, muscle and chest pains, headache, tingling in the extremities: all these are examples of symptoms reported to doctors, sometimes but not always in tandem with more objective symptoms such as wheezing, rhinitis, eczema or skin rashes.

People often complain of fatigue or poor concentration, or experience confusion, short-term memory loss or fits of crying.

Occupational medicine practitioners describe the occasional person who has been exposed to a chemical spill on the job and then develops pneumonia. After temporary improvement and a clearing X-ray, instead of getting better, the shortness of breath and chest pain increases.

At home, the worker's symptoms are worsened when he/she is exposed to chemical odours. Back on the job, when the worker is re-exposed to fumes, acute symptoms return. Then, even common household products or contaminants may cause debilitating respiratory symptoms. In the words of clinical ecologists, the patient is "sensitized" so that even small exposures to the same or another related substance will bring on a reaction.

Environmentally sensitive people may also experience adverse reactions to certain foods which may not occur for hours or even days after their consumption. This causes great problems in trying to determine exactly what substance or substances are causing the reaction. Sensitivities may be tested by keeping the individual on a very careful diet and in a chemically restricted environment for a period of days and then selectively re-introducing the substances suspected of causing the problems.

Clinical ecologists - doctors who subscribe completely to environmental causation of the syndrome - have developed "environmental units" for the care and testing of their environmentally sensitive patients. These units are pristine environments where a patient can remain for a period of a few days to remove the effects of the offending substance(s). Then, the doctor can introduce substances in a completely controlled way to test reactivity.

In most cases, the effects of environmental sensitivities are not severe enough to warrant complete isolation. Sensitive individuals may be able to continue to live or work in an environment which may contain a material or materials to which they react. But after some time in some cases, the syndrome may become completely debilitating and in these cases, emotional symptoms and incapacitating depression may be a secondary result.

Disease Prevention and Treatment

Prevention is the most important and simplest aspect of this problem if the offending agent(s) can be identified. Allergens or other offending agents that can be avoided or removed at home (animal dander, house dust mites, household chemicals) should be eliminated. Non-specific triggers which may aggravate the condition in sensitive persons (cigarette smoke, constant fumes, changes in temperature and humidity) should be investigated and controlled when possible. In persistent cases it may be necessary to consider the basic home construction, heating and cooling systems (electric heating is cleaner than oil heating) as well as potential problems of moisture and mildew in bathrooms or basement. Particular attention should be directed to the bedroom where children and older persons spend much of their time.

In the workplace, adequate ventilation, appropriate protective clothing and respirators for workers, coupled with proper waste disposal techniques, will avoid contamination of workers and others with toxic chemicals. The Workplace Hazardous Materials Information System (WHMIS) which was developed through consultation between government (federal, provincial, territorial), labour and industry, assists in this regard. This system requires suppliers and employers to alert workers to potential hazardous materials/ chemicals in their workplace. It also requires that employers inform workers both how to handle these materials safely and how to protect themselves using appropriate gear.

Improvement may be accelerated by reducing the overall load on the immune system. For example, when foods are an important agent, an allergy elimination diet may he recommended under careful medical supervision. This diet is structured to remove the foods which commonly cause an allergic reaction, including milk and milk products, cereal grains (wheat and corn) and refined carbohydrates (white sugar and white flour). Similarly, in instances where dust, grass pollen, or mould, are implicated, specific allergen immunotherapy may be useful.

Conclusion

In May of 1990, the Laboratory Centre for Disease Control, a research wing of the Health Protection Branch at Health and Welfare Canada organized a workshop of professionals and interest groups to discuss and debate the current state of investigation into environmental sensitivities. Participants included medical experts, health researchers and representatives of the Allergy Information Association, the Allergy and Environmental Health Association, the Canadian Society for Environmental Medicine, the Canadian Society of Allergists and Immunologists, the Canadian Public Health Association and the Canadian Medical Association.

This group was considered representative of current thinking on environmental sensitivities. The group concluded that the admission of the existence of the disorder is primary to further investigation, and also that a diagnosis of psychological illness should only be reached as a last resort.

Recommendations from the meeting have set in motion a positive, proactive approach to investigating and dealing with environmental sensitivities. Professionals and administrators agree that there is a great need for a coordinated effort to educate both public and professionals and provide necessary information to all interested groups.

In particular, they recommended that environmental sensitivities, because they so far lack a firm diagnostic base, need to be considered on a case-by-case basis, with acknowledgement of dysfunction or disability and compassion for the individual being the central tenets of treatment.

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Health and Welfare Canada
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Issues

BARBECUE SYNDROME

Introduction

Barbecue syndrome is the common name for a type of food poisoning caused by certain coliform bacteria known as verotoxigenic E. coli or VTEC. These bacteria cause illness by producing a toxin (i.e. poison) that can break down the lining of the intestines and damage the kidneys.

People who develop this syndrome frequently report that they ate ground beef prior to their illness. For this reason, the syndrome is sometimes called "hamburger disease". However, people have become ill after eating other kinds of undercooked meat and poultry, and after drinking unpasteurized milk or unchlorinated water. Ground beef may contain higher numbers of the bacteria than other foods because the grinding process helps to spread the bacteria through the meat.

VTEC was first recognized as the cause of barbecue syndrome in 1981. In 1982, 25 cases of VTEC were reported in Canada; in 1989 there were almost 2500 cases. This dramatic increase is likely a result of increased awareness of the disease and the development of better laboratory methods to diagnose the syndrome. Barbecue syndrome remains a major public health problem with about 1500 people reported to have developed this disease in both 1990 and 1991.

Some people who are infected with VTEC do not get sick at all; some feel like they have a bad case of the "flu", others experience severe or even life threatening symptoms. VTEC is the number one cause of kidney failure in children. Children, the elderly and other people whose immune systems are not fully functional are at greatest risk of developing more serious illness.

Two to 10 days after eating food contaminated with VTEC people may experience severe stomach cramps, vomiting and a mild fever. Some people will develop watery diarrhea; some of these people may later develop hemorrhagic colitis (bloody diarrhea). Most people recover seven to 10 days after the start of their illness.

Canada

However, about 10 per cent of people who have barbecue syndrome develop an unusual type of kidney failure and blood disorder called Hemolytic Uremic Syndrome (HUS). These people may require blood transfusions and kidney dialysis. Most people with HUS recover and dialysis can be stopped. However, some people require continuing kidney dialysis or a kidney transplant and for others HUS is fatal.

Where does VTEC come from?

The VTEC bacteria live in the intestines of cattle, other meat animals (such as pigs and sheep) and possibly poultry. When animals are butchered, the bacteria can get onto the outer surfaces of the meat. When the meat is ground, VTEC can be spread further to all the newly exposed surfaces. This is why ground meat is more likely to be contaminated than roast or steaks.

What is being done?

Inspectors from Health and Welfare regularly inspect food manufacturing and storage facilities to monitor and enforce good manufacturing processes and food handling practices. Samples of products are analyzed for various microorganisms which cause health concerns. Surveys have been conducted to determine how often meat and poultry carcasses and ground meats are contaminated by VTEC. Provincial and municipal health organizations regulate restaurants and retail stores.

Health and Welfare Canada has been studying these VTEC and the illness they cause. The level of VTEC contamination of meat appears to depend on many factors. Some of the factors include the type of animals slaughtered, the procedures used to butcher the meat, the procedures used to grind the meat and the temperature used to store the meat. Studies have also shown that VTEC and its toxin are easily destroyed at temperatures achieved when food is fully cooked.

What can individuals do?

Proper handling and cooking of food can practically eliminate this disease.

KEEPING IT COOL:
Meat should be refrigerated or frozen as soon as possible after being purchased. It should always be thawed in the refrigerator, not at room temperature. Meat should not be removed from the refrigerator until just prior to cooking.

PREPARATION:
Prepare thin hamburger patties to allow the hamburger to cook thoroughly without charring the outside. Cooked foods must not come into contact with uncooked foods, or with utensils which have been in contact with uncooked foods. When moving cooked food from the barbecue or stove to the table, be sure to use a clean plate and not the one which was already used for the raw meat.

COOKING:
Hamburgers and other ground meat must be cooked completely through so that the **meat is brown and the juices are clear** rather than pink. You can eat most roasts and steaks a little rare, as long as they are well-cooked on the outside. However, rolled roasts must be cooked like ground meat, so that no pink remains. Poultry also must be cooked until there is no pink left near the bone.

KEEPING IT HOT (and cooling it again QUICKLY):
Eat cooked foods while they are still hot. Foods left to cool at room temperature permit the growth of a number of disease-causing microorganisms. Likewise, leftover food should be refrigerated immediately.

A GOOD RULE IS TO KEEP HOT FOODS HOT AND COLD FOODS COLD.

WASHING:
It is very important to wash dishes, cutting boards and counters with hot, soapy water and bleach after handling meat to prevent bacteria spreading to other foods. By the same token, you should wash your hands both before and after handling foods.

EATING OUT:
Any food which might contain bacteria which cause diarrhea must be thoroughly cooked before it is safe to eat. Always make sure foods which should be cooked are served to you well cooked and hot. If they are not, ask for them to be cooked longer whether you are eating out in a restaurant or at a friend's home.

MILK:
Avoid drinking raw or unpasteurized milk.

Conclusion

The best way of preventing this and other foodborne illness is by educating consumers. Properly informed people, aware of the dangers of eating contaminated food, can avoid these diseases by following carefully the above guidelines for the safe handling and cooking of food.

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Health and Welfare Canada
Santé et Bien-être social Canada

Health Protection Branch

ISSUES

AIRCRAFT NOISE IN THE VICINITY OF AIRPORTS -

Implications for Human Health

Introduction

Jet aircraft are probably one of the most disturbing sources of noise in the environment today. People who live in neighbourhoods around airports have become increasingly concerned about possible health effects from aircraft noise. This is especially true in cities with international airports, such as Toronto and Vancouver, where runway expansions have been proposed for their major airports.

Can the aircraft noise damage my hearing?

Hearing loss may seem to be an obvious hazard for those living near large airports. But, recent estimates by Health and Welfare Canada have shown there is no significant risk of permanent hearing loss from aircraft noise for residents around Lester B. Pearson International Airport in Toronto - Canada's largest airport. These findings are consistent with the results of several studies performed at major airports in the United States.

That aircraft noise is not a significant risk to hearing may seem surprising to anyone who has been outdoors when a jet has flown directly overhead during takeoff or landing. If experienced *continuously*, such noise would cause significant hearing loss. However, as the noise only lasts for a short time and is intermittent rather than constant, the chance of hearing loss is negligible. It is *continuous* daily average exposure to noise over a number of years that determines the amount of hearing loss. The amount of time people spend indoors, where noise levels are much lower than outdoors, also reduces average noise exposure.

Canada

Can exposure to aircraft noise cause stress?

There is little doubt that aircraft noise can cause stress in several ways. It can certainly be mentally stressful to people living near airports, mainly because it disturbs sleep and interferes with conversation or listening to radio or television. For environmental planning purposes, the amount of stress experienced in a particular community has been estimated by researchers. This is done by comparing the noise level in the area with the percentage of people who indicate on questionnaires that they are highly annoyed by aircraft noise.

Many laboratory studies have shown that exposing people to loud noise has some temporary, moderate effects on heart rate and blood flow in the skin. These studies suggest that hearing aircraft noise can directly stress the parts of the central nervous system that control the automatic functions of the body. Some recent, preliminary studies also suggest that exposure to loud noise can cause temporary suppression of the immune system, but more research is required to verify these results.

It is not known whether these physical stress effects become chronic in people continually exposed to loud noise in their daily lives. Most laboratory studies show that the stress response disappears after a relatively short time in people who are exposed to continuous or routine patterns of noise. However, some studies suggest that the stress response does not diminish if the person is asleep or if the noise occurs unexpectedly.

Can the stress caused by aircraft noise affect my health?

The possibility that exposure to aircraft noise can increase the risk of stress-related diseases has been the subject of controversy for many years. At present, there is no convincing evidence that aircraft noise causes such stress-related diseases. Several studies have been done to determine whether people who live near airports have a higher incidence of certain stress-related diseases. Most studies have been concerned with cardiovascular disease; some have examined possible increases in fetal abnormalities and mental illness. Most studies which maintained a link exists were not rigorous enough to be conclusive. Several rigorous studies have found that the risk was too small to detect or predict.

What can I do to minimize my exposure to aircraft noise?

Be informed. If you are planning to move to an area near an airport, consult Canada Mortgage and Housing Corporation's (CMHC) publication entitled "New Housing and Airport Noise". In addition, you could consult the land-use guidelines of Transport Canada and the appropriate provincial and municipal governments. You may also refer to the National Guidelines for Environmental Noise Control published by Health and Welfare Canada. The National Guidelines include ideal noise exposure levels, as well as general land-use zoning guidelines. Contact the local airport to get the approximate noise contour in your neighbourhood. You may then compare the contours in the guidelines to the contour in your area.

If you are building or renovating a home near an airport make sure there is adequate acoustic insulation to help reduce noise levels. Consult CMHC's "New Housing and Airport Noise" for the recommended acoustic insulation for the noise contour in your neighbourhood.

If aircraft noise levels are highly annoying register a complaint with the noise management office at the airport.

What is Health and Welfare Canada doing about this issue?

Health and Welfare Canada provides advice on the health effects of environmental noise. For example, the Department presented submissions on the health effects of aircraft noise exposure at the environmental impact assessment hearings for the proposed runway expansion at the Lester B. Pearson International Airport in Toronto. In addition, Health and Welfare Canada has published the National Guidelines for Environmental Noise Control, which are based on reducing speech interference and sleep disturbance to acceptable levels.

Experts at Health and Welfare Canada will continue to assess the potential health effects of aircraft noise by reviewing all relevant research and will soon undertake research within the Department. This program will provide the scientific basis for creating comprehensive guidelines for assessment and control of the health effects of aircraft noise on the residents of neighbourhoods around airports.

March 4, 1993

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ISSUES

FOLIC ACID: THE VITAMIN THAT HELPS PROTECT AGAINST NEURAL TUBE (BIRTH) DEFECTS

Introduction

Medical science is frequently giving us information on how to lead a safe, healthy life. Tremendous amounts of time and testing are dedicated to improving and ensuring our well being. Nowhere is this research more important than in the birth of healthy babies.

Several scientific studies have shown that taking supplements of one of the B vitamins (folic acid) for a period of time before and after conception can greatly reduce the risk of the birth defects called neural tube defects (NTDs). Low folic acid intake certainly doesn't mean a woman will have a baby with an NTD, but the chances are much smaller with sufficient intake. All women of child-bearing potential can now benefit from these new findings.

The most important point in these findings, however, is that **sufficient amounts of folic acid are required before conception takes place**. This may not seem to be a key consideration, but about 50 per cent of the pregnancies in North America today are unplanned. So, all women who are capable of becoming pregnant need to ensure they have a sufficient daily intake of folic acid.

What are Neural Tube Defects?

Neural tube defects are rare but serious birth defects. Approximately 400 babies are born each year in Canada with a neural tube defect. NTDs are caused when the brain and spinal cord fail to develop properly. The critical time for this development is the third and fourth week after conception (the first and second week after the first missed menstrual period). At this early stage many women may not realize they are pregnant.

NTDs include spina bifida, encephalocele and anencephalus. Spina bifida and encephalocele may result in lifelong, serious disability including lack of bowel and bladder control and paralysis. The most common NTD, accounting for about 300 of the 400 NTD births each year, is spina bifida. Anencephalus, the most severe of the NTDs, causes babies to be stillborn or to die soon after birth.

Canada

The Link Between Neural Tube Defects and Folic Acid

Folic acid is one of the eight B vitamins required by humans. It is required for many processes in the human body. Folic acid is also known by the names **folacin** and **folate**.

Studies provide strong evidence that folic acid supplements can reduce the risk of an NTD-affected pregnancy; evidence suggests that a diet high in folic acid may protect against NTDs as well. In response to the new information available, Health and Welfare Canada recommends the following:

- As early as possible when planning a pregnancy, women should consult their physician about folic acid supplements.

- Women with a previous NTD-affected pregnancy are at a higher risk of having another affected pregnancy. These women should consult their physician about folic acid supplements.

- All women of child-bearing potential should follow *Canada's Food Guide to Healthy Eating* and take care to choose more foods higher in folate.

Increasing Your Folic Acid Intake

Supplements:

Folic acid is available as a single vitamin supplement pill. A dose of 0.4 mg per day is considered adequate and safe. Some multivitamins also contain varying levels of folic acid; others contain none. It is best to consult your physician before deciding on a folic acid supplement. It should be noted that a high intake of folic acid supplements may hide a vitamin B_{12} deficiency. Although B_{12} deficiency is rare in reproductive-age women, neurologic damage may occur if the B_{12} deficiency is not diagnosed and treated. The performance of anti-cancer or epileptic drugs may also be affected by folic acid. In addition, multivitamins usually contain vitamin A. Too much vitamin A can harm a developing baby or have toxic effects on an individual so the daily dosage recommended on the label should be followed.

Diet:

Folic acid is found in nearly all foods, but is particularly high in dark green vegetables (such as broccoli, spinach, romaine, peas and brussels sprouts), corn, dried peas, beans and lentils and orange juice. Whole grain products and foods with added folic acid are also significant sources. *Canada's Food Guide to Healthy Eating* encourages women to increase their folacin intake by recommending they choose foods higher in folate more often. Intake can be further increased by choosing the higher number of servings from the *Guide's* Vegetables and Fruit Group and including a few foods that are good or excellent sources of folate every day. Prolonged cooking should be avoided as it destroys folates found in foods. The labels of packaged foods may also help you identify sources of folic acid. A table listing folate-rich foods is attached.

Conclusion

Folic acid will not prevent all birth defects, nor will it prevent all cases of neural tube defects. But, there is evidence that folic acid supplements will greatly reduce the risk; a diet high in folic acid may also reduce the risk. If you are planning a pregnancy or may become pregnant, see a physician to discuss your folic acid requirements. All women should strive for a healthy lifestyle including physical activity and good overall eating habits. Pregnant women should avoid alcohol, smoking and use of unnecessary drugs. Together, these behaviours will improve the chances for healthy babies.

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TABLE - FOOD SOURCES OF FOLATE

"Excellent Sources"	"Good Sources"	"Sources"
VEGETABLES		
Asparagus, boiled, drained 4 spears Belgian endive (Witloof), raw, 1 head Brussels sprouts, boiled, drained 1/2c Collards, frozen, boiled, drained 1/2c Greens of turnip, mustard, chicory, (not beet) boiled, drained 1/2c Spinach, boiled, drained 1/2c	Beans, mung, sprouted, stir-fried 1/2c Beets, boiled, drained 1/2c Broccoli, chopped, boiled, drained 1/2c Cauliflower, boiled, drained 1/2c Chinese cabbage (Pak-choi, Pe-tsai) boiled, drained 1/2c Corn, sweet, canned, niblets 1/2c Lettuce, romaine, escarole, cos 1c Okra (gumbo), boiled, drained, sliced 1/2c Parsnips, sliced, boiled, drained 1/2c Peas, boiled, drained 1/2c	Beans, snap, boiled, drained 1/2c Cabbage, boiled, drained 1/2c Carrot, raw, 1 medium Celery, raw, 1 stalk Coleslaw w/dressing 1/2c Green pepper, boiled or raw, 1 whole Leek, boiled, drained 1/2 leek Lettuce, iceberg, bibb, Boston 1c Onions, chopped, boiled, drained 1/2c Parsley, 10 sprigs Potato, boiled, baked or microwaved 1 medium Snowpeas, boiled, drained 1/2c Squash, acorn, baked 1/4 squash Sweet potato, baked 1 medium Tomatoes, red, raw 1 medium Vegetables, mixed, frozen, boiled 1/2c Zucchini, boiled, drained 1/2 c slices
DRY PEAS, BEANS, NUTS AND SEEDS		
Baked beans w/pork 2/3c Beechnuts, 1/4c Black beans, dry, boiled, drained 1/2c Broadbeans (fava) dry, boiled, drained 1/2c Chestnuts, European roasted 10 kernels Kidney beans, dry, boiled, drained 1/2c Lentils, cooked 1/2c Lima beans, dry, boiled, drained 1/2c Peanuts 1/4c Pinto beans, dry, boiled, drained 1/2c Soybeans, dry, boiled, drained 1/2c Sunflower seed butter 2 Tbsp Sunflower seed kernels, 1/4c	Filberts or hazelnuts, whole 1/3c Peanut butter 2T Tahini (sesame butter) 2T Walnuts, halves 1/2c	Sesame seeds, 2 Tbsp Tofu, 1 block (100g)

TABLE - FOOD SOURCES OF FOLATE

"Excellent Sources"	"Good Sources"	"Sources"
FRUITS	Avocado 1/4 fruit Boysenberries, frozen unsweetened Melon, casaba, cantaloupe, honeydew 1/10 fruit Orange 1 medium Orange juice, fresh or frozen 1/2c Plantain 1 fruit	Banana, raw, 1 medium Blackberries 1/2c Grapefruit 1/2 Orange juice, canned 1/2c Pear, raw, 1 medium Pineapple juice 1/2c Raspberries 1/2c Strawberries, raw 1/2c Tangerine, 1 medium
CEREALS, BREADS & FLOURS Soy flour, low fat 1/4c Wheat germ, toasted cereal or raw 30g	Bran breakfast cereals 30g	Bagel 1/2 Bread, whole wheat 1 slice Bread, white (no added folate) 1.5 slices Breakfast cereals (with added folic acid) 30g English muffin plain 1 Pasta, spinach, cooked 1/2c Whole wheat flour, 1/4c White wheat flour 1/2c
OTHERS Peanut bar 1 40g bar Chocolate-coated peanuts 25 pc Beef kidneys, simmered 60g Yeast, brewer's or baker's, dry 1 tsp	Halvah (made with sesame seeds) 30g Eggs, raw or cooked in shell 1 large	Milk 1c Yogourt, plain 3/4c Tea, brewed 1c

Notes to this table:

1) The serving sizes for each food are the same as in the Canada's Food Guide to Healthy Eating.
2) It is suggested that you follow the numbers of servings recommended in Canada's Food Guide to Healthy Eating* , taking care to choose good and excellent sources of folate often.
3) Servings of "Excellent Source" foods contain 0.055 mg or more folate, "Good Sources" 0.033-0.054 mg, and "Sources" 0.011-0.032 mg. Please note that these amounts apply to raw or moderately cooked foods. Prolonged or severe cooking can destroy much of the folic acid in foods.

*** Vegetables and Fruits 5-10 servings, Grain Products 5-12, Milk Products (adults) 2-4, Meat and Alternatives 2-3.**
c = cup, tsp = teaspoon, Tbsp = tablespoon

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ISSUES

UNDERSTANDING TUBERCULOSIS

Introduction

Tuberculosis (TB) has been around for centuries. Once known as "consumption", tuberculosis claimed the lives of such well known figures as the Bronte sisters, Robert Louis Stevenson and Vivian Leigh. Improved treatment and drug therapy has seen the number of TB cases reported in Canada sharply decline since the Second World War. At that time more than 14,000 new cases of TB were reported each year and over 17,000 patients were placed in TB sanatoriums. The last of Canada's TB sanatoriums was closed in the 1970s. Since 1987 the number of TB cases reported has remained constant. Approximately 2,000 cases are reported each year in Canada. Investigations are now being conducted to understand why the number of TB cases reported is no longer decreasing.

Exposure to Tuberculosis

Tuberculosis is caused by bacteria that belong to a group of organisms called *Mycobacterium*. In Canada, TB is usually caused by *Mycobacterium tuberculosis*.

To acquire TB, you must be in contact with someone who has infectious or *active* tuberculosis. When someone with infectious TB coughs, they release TB organisms into the air. TB spreads when someone inhales TB organisms floating in the air around them.

Frequent exposure to an infected individual is usually required to develop tuberculosis. It is estimated that exposure for eight hours a day for six months is necessary for an average, healthy adult to acquire the disease.

People who are not included in, or in very frequent contact with, the high risk groups listed below are unlikely to be exposed to someone with infectious tuberculosis. They are therefore unlikely to become infected with TB.

High Risk Groups

High risk groups include: immigrants to Canada, particularly those from Asia, Native Peoples, people with HIV/AIDS, homeless urban-core residents and seniors. People living in overcrowded and poor living conditions are also at greater risk of developing TB.

People working in health care institutions and other social service organizations may have frequent contact with high risk individuals. Effective safety programs can prevent the development of TB in any exposed worker.

Symptoms

Different scenarios occur after someone has inhaled the TB bacteria. Most people do not go on to develop infectious TB. Special tests like a Mantoux skin test can show that someone was exposed to TB organisms. These people do not become ill and cannot spread TB to others. Ninety per cent of people who inhale TB causing organisms remain in this "truce" situation for the rest of their lives.

Only ten per cent of people go on to develop *active* (infectious) TB. These people may complain of fatigue, weight loss, cough persisting for more than four weeks, a general feeling of being unwell and, in an advanced case coughing up blood. X-rays and special laboratory tests are used to diagnose active TB. Until these people receive treatment they may spread TB to others.

Most people develop infection in their lungs (pulmonary tuberculosis). Rarely, people also develop infections involving the brain (meningitis), kidneys, skin, bones, joints or lymph nodes.

Successful Treatment of Tuberculosis

To control TB, all cases of *active* tuberculosis must be identified and a full course of appropriate treatment completed. In addition, people who develop a positive Mantoux skin test after exposure to someone with active TB should receive preventive therapy for one year. This will substantially reduce their chances of developing TB.

Successful treatment of active tuberculosis requires months of meticulously taking at least two drugs. A combination of drugs is given to prevent the development of drug-resistant tuberculosis. Completing the full course of treatment is very important as the most common reason a person develops drug resistance is because they have not followed the prescribed treatment.

Drug-Resistant Tuberculosis

Drug-resistant TB has been reported in Canada for decades. In most of these cases, the TB organism was resistant to a single drug. However, a few of these reports describe cases of multiple drug-resistant TB (MDR-TB).

The United States has reported several outbreaks (large number of cases) of MDR-TB since 1987. These large outbreaks have occurred among HIV/AIDS infected individuals. No outbreaks of multi drug-resistant TB have occurred in Canada.

The key to preventing MDR-TB in Canada lies in two major programs: early identification and appropriate treatment of all active TB cases and provision of preventive therapy for exposed individuals who develop a positive Mantoux skin test. These programs will prevent the development and spread of tuberculosis as well as MDR-TB. A registry of all drug-resistant tuberculosis organisms has been established.

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ISSUES

WEEDKILLER - 2,4-D

Introduction

The weedkiller 2,4-D has been used in Canada for almost 50 years. It is a popular choice because of it's low cost and effectiveness on broad-leaf plants. It controls weeds in a wide variety of settings: farms, roadsides, industrial sites, parks, golf courses and home lawns and gardens.

Taken up by the weed's roots and leaves, 2,4-D kills the plants by "mimicking" the action of weed hormones. This stunts certain growth processes in the plant.

In recent years, the use of 2,4-D as a weedkiller has become controversial. Concerns have surfaced about potential health effects resulting from exposure to this chemical.

Are there Health Risks from 2,4-D?

Several American and European studies have linked workplace use of 2,4-D with certain cancers. Unfortunately, the results of these studies were conflicting and inconclusive. Surveys of heavily exposed workers and studies of people living where 2,4-D and related herbicides are heavily used have also been carried out. Again, no clear evidence was found linking these chemicals to adverse reproductive effects such as decreased fertility, miscarriages, stillbirths and birth defects. Experiments studying human and animal response to 2,4-D show that the chemical does not build up in the body, in fact it is eliminated rapidly.

However, poisoning with 2,4-D has occurred. This is usually due to accidental exposure to, or intentional ingestion of, large amounts of the chemical. These cases often result in full recovery although a few fatal cases were reported from suicidal consumption of 2,4-D in the 1960's.

All chemicals, including 2,4-D, should be used with caution. The best way to ensure good health is to closely follow the "Safe Handling of Pesticides" instructions detailed below. As with other substances or chemicals, 2,4-D may affect some individuals. People who consider themselves sensitive to chemicals should avoid exposure to 2,4-D as much as possible.

Who might come in Contact with 2,4-D?

Workers who mix, load or apply 2,4-D to crops, turf grasses and roadsides etc. risk over-exposure. Workers who handle 2,4-D in manufacturing and formulating industries are also at risk. The extent of exposure depends on several factors, for example: how 2,4-D is applied, the equipment used for application, the amount handled daily, duration of exposure, use of protective equipment and clothing and the worker's hygiene.

Home owners may, at times, be exposed to 2,4-D. This is not surprising considering the variety of lawn and garden products containing this chemical. Incorrect application may also unintentionally expose bystanders to 2,4-D.

The most likely means of exposure for anyone is through skin contact. This may occur directly with the chemical itself or through contact with treated surfaces. Consuming 2,4-D through food or inhaling dust or vapour are less likely.

Health and Welfare: Testing and Monitoring

Health and Welfare Canada carries out detailed evaluations on the health and safety data of hundreds of chemicals, including 2,4-D. Data to date does not show 2,4-D causing adverse health effects at the expected exposure rate. Scientists continue to monitor research.

Safe Handling of Pesticides

If you work with or use a product containing 2,4-D, or any other pesticide, use the following precautions:

- Carefully read the information and follow directions on the product label. Note the uses, rates, application equipment, cautions and hazards.
- Always wear protective clothing and safety equipment recommended on the label.
- Do not rub your eyes or touch your mouth while working with the product and don't eat, drink or smoke in your work area.
- Keep 2,4-D containers out of the reach of children.

- Shower thoroughly and change your clothes after exposure to, or completing application of, 2,4-D.
- Wash the exposed clothes separately from your normal laundry.
- Post signs warning passers-by that you have treated an area with pesticides.
- Keep pets and children away from treated areas.
- Do not apply pesticides when wind conditions may cause drift into areas not intended for treatment.

If others are using 2,4-D or any pesticides, avoid these areas for a few days. This allows the pesticide residues to evaporate. This is particularly important for children.

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ISSUES

RECREATIONAL WATER QUALITY

Introduction

Canadians have an abundance of fresh and salt water that can be used for recreational purposes. Three oceans border our shores and the Great Lakes plus thousands of other lakes, rivers and streams exist throughout Canada. Unfortunately, waters in and around urban centres and agricultural regions are becoming increasingly contaminated.

How do recreational waters get contaminated?

There are many sources of contamination. These include: sewage or industrial waste discharged into rivers, agricultural run-off (including manure, fertilizers and pesticides) and urban run-off such as fertilizers which promote algae and weed growth. Other sources of pollution include: storm water run-off, animal faeces, numerous bathers (especially those with infections), oil and gasoline spills from power boats and marinas and pollution from boaters.

What are some of the health risks of swimming in polluted water?

Microbiological contamination (e.g. poorly treated sewage) can cause a number of illnesses. The most common are gastrointestinal illnesses such as diarrhoea and respiratory, eye, ear, nose or throat infections. Chemical pollutants may also pose health risks but disease causing microorganisms from poorly treated sewage are a greater risk.

Swallowing water is the main way pollutants enter the body. They may also gain entry through broken skin or through the ears, eyes or nose. Other physical hazards are also possible when swimming in polluted water. If water is not clear due to contamination or weed growth, objects like rocks and broken glass are much less visible and more likely to cause injury.

Canada

How can I help make recreational water safer?

There are many ways individuals can help to keep recreational water safe.

- Avoid going in the water if you have an open wound or an infection.
- Don't use soap in recreational water. Soap nourishes algae and bacteria, helping them to grow.
- Take limited amounts of food to beaches to discourage animals and birds which leave droppings. Don't feed animals or birds, and securely close garbage bins.
- Pick up your pet's droppings and dispose of them hygienically.
- Avoid using fertilizers near recreational water.
- If you live in a rural area make sure your septic system works properly.
- Practise pollution-free boating by disposing of human wastes hygienically.
- Encourage your municipality and local industry to treat waste properly.

What is the federal government doing about this issue?

Regulations on recreational water quality are a provincial and territorial responsibility. To set standards for health and safety across Canada, Health and Welfare Canada worked with officials in these areas to develop and publish national guidelines for recreational water quality now used across the country. Updated in 1992, these guidelines are available for a small charge from the Canadian Government Publishing Centre and authorized bookstores.

These guidelines help to ensure recreational waters are as free as possible from microbiological, physical and chemical hazards. To determine the risk of disease or harm the guidelines recommend conducting an environmental assessment or "sanitary survey" at the beginning of each bathing season. Special attention should be given to: inadequately treated sewage or chemicals, drainage which may contain sewage or chemicals, any physical hazards, seasonal variability of hazards such as number of bathers, water temperature and circulation plus fluctuation of water quality with rainfall.

Local health authorities monitor the water quality at public beaches on a regular basis throughout the bathing season. They test the water using an appropriate "pollution indicator organism". This is a common microorganism in the human digestive tract which shows the presence of faecal contamination.

Local health authorities are also responsible for investigating any illnesses or injuries resulting from bathing at public beaches. If the number of reported problems is unusually high the authorities will either increase their monitoring of water quality or close the beach to the public. In some cases, such as an outbreak of illness, tests for disease-causing organisms such as viruses are conducted.

The public is notified in various ways, including media reports and signs along the shoreline when a body of water is considered unsuitable for swimming. More details on the reason for the closure and the potential health risks involved can be obtained from the local health authorities.

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ISSUES

COOKWARE SAFETY

Introduction

Most cookware in Canada is safe to use for daily meal preparation, provided it is well maintained and used as intended by the manufacturers. However, some materials used to make cookware can potentially enter the food we eat. Therefore, a review of current knowledge about the safety of cookware is useful.

Aluminum Cookware

Because aluminum is lightweight, conducts heat well and is fairly inexpensive, it is a popular choice for cookware.

Canadians normally take in about 10 milligrams (one milligram is one one-thousandth of a gram) of aluminum daily, mostly from food; cookware contributes only about one or two milligrams of the total. While aluminum has been associated with Alzheimer's disease, at present there is no definite link between this metal and the causes of the disease. The World Health Organization estimates that adults could consume over 50 milligrams of aluminum daily without harm, so there is little cause for concern.

Remember that during cooking aluminum dissolves most readily from worn or pitted pots and pans. Also, the longer food is cooked or stored in aluminum vessels the greater the amount dissolved into food. Leafy vegetables and acidic foods (such as tomatoes and citrus products) absorb aluminum most readily.

Copper Cookware

Since copper cookware conducts heat well, it allows for precise control of cooking temperatures. Brass, an alloy of copper and zinc, is less commonly used for cookware.

Small amounts of copper contribute to everyday health. However, large amounts of copper in a single dose or over a short period can be poisonous. It is not certain how much can be safely tolerated each day.

Canada

As a precaution, copper and brass cookware sold in Canada are coated with another metal. This prevents the copper from coming into contact with food. Small amounts of the coating can be dissolved by food, particularly acidic food cooked or stored for long periods in the cookware. Nickel is one of the metals used in coating. Anyone allergic to nickel may have a reaction to nickel coated cookware.

Coated copper cookware can lose its protective layer if scoured. Do not use badly scratched or uncoated copper cookware to cook or store food.

Stainless Steel and Iron Cookware

Stainless steel, an alloy of iron and other metals, is strong and resists wear and corrosion. Stainless steel is the most common material used for cookware in North America. Iron cookware is inexpensive and durable.

The metals present in stainless steel or iron cookware which may produce health effects are iron, nickel and chromium.

Iron is essential in producing red blood cells. Large amounts can be poisonous, but North American people are more likely to lack iron than to have too much. Iron cookware has been estimated to provide less than 20 per cent of total daily iron intake - well within safe levels.

Nickel is not poisonous in small quantities but can cause an allergic reaction. People who are sensitive to nickel can react to even trace amounts in stainless steel. Such people should avoid using stainless steel cookware.

Small doses of chromium, like iron, are beneficial but can be harmful in higher amounts. The safe intake range is about 50 to 200 micrograms (a microgram is one one-millionth of a gram) per day and most Canadians take in amounts in this range. One meal prepared with stainless steel equipment gives about 45 micrograms of chromium, not enough to cause concern.

Ceramic, Enamel and Glass Cookware

Ceramics (pottery), enamel and glass cookware are easily cleaned and can be heated to relatively high temperatures. Ceramics used in cookware are glazed, which gives them a smooth surface; similar glazes are applied to metal, making enamelware. These glazes, a form of glass, resist wear and corrosion.

Any concern about hazards from glassware or enamelware comes from minor components used in their manufacture, or decoration. This material may include some pigments and lead. The likelihood of any potentially harmful material entering food is controlled through manufacturing techniques.

In Canada, the sale, advertising and importation of glazed ceramicware used for food have been regulated since 1971. Glazed ceramicware is permitted to release only very small amounts of lead and cadmium. Glazed ceramicware from abroad and personally imported by Canadians may not meet the Canadian permitted levels of lead and cadmium. Some other countries do not have the same strict legislation on glazes.

Plastics and nonstick coatings

For cooking and storing food, plasticware is lightweight and nearly unbreakable. Many items have been developed for use in microwave ovens, where metal cookware is not suitable.

Using plastic containers and wrap for anything other than their original purpose may cause health problems. The concern with wrap is that food may absorb some of the plasticiser (a material that helps make the wrap flexible). This is most likely to occur at high temperatures (like microwaving) and with fatty or oily foods like cheese and meat. It is best not to use plasticware or plastic wrap in the microwave unless it is specifically labelled as microwave safe by the manufacturer. If you reuse items for storage, like dairy product containers, let the food cool before storing it in them, then refrigerate immediately.

Avoid visibly damaged or stained plastics or containers with an unpleasant odour. Do not heat or store food in plastic containers that were not intended for food.

Nonstick coatings applied to metal utensils prevent food from sticking to them and protect cookware surfaces. They are chemically inert, so even if some of the material is swallowed it would pass through the body harmlessly. The only time nonstick coatings are likely to pose any risk is if they are heated to temperatures greater than about 350°C or 650°F. This might happen if an empty pan remains on the stove. In this case, the coatings can give off irritating or poisonous fumes.

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Health Protection Branch

Issues

ARTS, CRAFTS & WOODWORKING MATERIALS:

AVOIDING POTENTIAL HAZARDS

Introduction

If you are an artist or craftsperson you may have assumed all arts materials are safe to work with - as many are. However, some common arts materials can be hazardous without proper precautions.

Possible Health Effects

A few arts materials are dangerous enough to cause burns or illness after one exposure if you get them on your skin, in your eyes or if you swallow or inhale them. There is also the possibility that repeated exposure to small amounts of certain materials could cause adverse health effects. Warning signs may include: headaches, dizziness, tiredness and severe mood swings. While these symptoms may have other causes, leave your project for a few days to see if you feel better. Prolonged exposure to some substances can damage internal organs.

Pregnant women should be particularly careful, as should those with medical conditions or those taking medications. Young children are at greater risk from poisonous materials, so these materials should be kept out of their reach.

Avoiding Possible Hazards

Learn about the materials and techniques you are using and look for safer alternatives. Don't try something new until you have found out about potential hazards. Don't smoke, eat, drink or apply makeup in your work area. Do not wear contact lenses, which can trap dust or splashed liquids causing eye damage. Label all materials and containers carefully and do not store them near food or drink.

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Canada

Some common hazards are dusts and vapours from solvents and corrosive materials such as acids. Use the safest materials and work with the smallest quantities possible. Use a closed mixing box to control dust from powders and clean up with a wet mop to avoid stirring up dust.

Proper ventilation is crucial. Depending on the materials you work with, bringing in fresh air may be enough; for more hazardous materials use a fan to draw air past your face, then over the workpiece and away from you. For the most hazardous procedures, a laboratory hood or spray booth is best.

Sometimes protective equipment is the only effective measure. Goggles protect against splashes and flying splinters. Use ear protection for continuous or loud noise, rubberized gloves when working with solvents or corrosive liquids. A dust mask or respirator should be used for poisonous dusts or vapours.

Install a smoke detector and have a fire extinguisher available. Keep only minimal amounts of flammable materials on hand and keep them away from sources of sparks or open flames.

Hazards of Specific Processes

Jewellery Making and Enamelling: The greatest risks arise from inhaling dusts and fumes during soldering, pickling, casting and finishing. If possible, avoid fluoride-based soldering fluxes and solders and enamels containing lead or cadmium. Electroplating and electroforming solutions can be poisonous or give off hazardous fumes. Metal cyanide solutions are very dangerous and it is best not to use them. If you use silica, wear a toxic dust respirator approved by CSA* or NIOSH**. It is important to work with good ventilation (using a laboratory hood if possible), and ear and eye protection. If handling corrosive substances, use gloves as well. A source of running water should always be readily available.

Painting and Drawing: Exposure to dusts from dry pigments and inhalation of solvents used for airbrush spray paint and cleaning are the main potential hazards. Many products are also flammable. Traditional pigments may contain poisons such as arsenic, cadmium, lead, mercury and chromates. Use safer alternatives if possible. To control dust, buy premixed paints whenever possible. Use common sense when working with paints - pointing a brush with your lips could be a dangerous habit.

Solvents are used in felt-tip markers, varnishes, lacquers, thinners, cleaners and as components of paints; avoid inhaling their vapours. Solvents can strip skin of oil causing rashes, itching and cracking. Consider alternatives: water- or alcohol-based paints, and soap and baby oil for cleanup. Try rubberized gloves or barrier cream. Good ventilation is crucial when using spray techniques. If using spray techniques wear an approved respirator or work with a fume hood, spray booth or outdoors.

Photoprocessing: Developers, fixers, stop baths and intensifiers can contain chemicals that are irritating, poisonous or able to produce dangerous fumes. Black and white processing contains fewer hazards than colour. These solutions can be poisonous through skin contact or inhalation. Wear gloves and eye protection when mixing or diluting concentrated chemicals and use tongs in photographic baths. Mix powders in a mixing box or wear a CSA- or NIOSH-approved toxic dust respirator. Make sure your darkroom has plenty of ventilation and have an eyewash fountain or a small water hose readily available. When preparing stop baths add acid to water and not the other way around.

Printmaking: Pigments and solvents present hazards similar to those outlined under **Painting and Drawing**. Etching acids can cause skin, eye and lung irritation or produce poisonous gases. Concentrated acids can cause serious burns. Wear eye protection and rubberized gloves when working with acids. Also use a fume hood or spray booth when working with etching acids or with solvent-based inks or other materials.

Woodworking: Most risks come from repeated inhalation of wood dusts. Softwood dusts can irritate the nose and throat; prolonged or repeated exposures to hardwood dusts cause more serious problems, including lung damage. Solvents and adhesives in stripping, gluing and finishing materials can also pose health risks. Use ear and eye protection and good ventilation while woodworking. Wear rubberized gloves or use a barrier cream when you handle solvents.

Further Information

Manufacturers or suppliers provide *Materials Safety Data Sheets* (MSDSs) for their products that are also intended for the workplace. If you are working as a hobbyist or a professional, read them. They explain a product's potential hazards and what precautions to take. Please contact Health and Welfare Canada for further information.

* Canadian Standards Association
** National Institute of Occupational Safety and Health

July 6, 1993

Arts, Crafts & Woodworking Materials: Avoiding Potential Hazards is one of a series of Issues produced by the Health Protection Branch of Health and Welfare Canada for the public, media, and special interest groups.

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Health Protection Branch

Issues

SUNSCREENS

Today, more than ever before, concerned Canadians are protecting themselves from the sun. When participating in outdoor activities, you should wear a hat and adequate clothing to cover the exposed skin. Also, you should apply a sunscreen on the parts of the body that cannot be covered by clothing. If possible, avoid exposure to the sun between 10:00 am and 3:00 pm. Sunscreens are not intended to allow increased sun exposure time but to provide protection during unavoidable exposure to the sun.

Sunscreens: Drugs or Cosmetics?

All lotions and creams claiming to protect against the adverse effects of the sun are regulated as drugs and are subject to pre-market review. If a manufacturer states a sun protection factor (SPF), there must be data to support the claim. SPF is determined using a standard test protocol, and indicates the level of protection against UV-B radiation. Health and Welfare Canada has made changes to the guidelines on cosmetic labelling to ensure that labels of cosmetics do not make any direct or implied references to sunscreens, sunblocks or protection from the sun's rays.

Cosmetic suntan lotions are sold to enhance the appearance and may also be labelled as a skin moisturizer. Other tanning products contain ingredients to darken the skin, so that it looks tanned. Buyers must be careful because these products may not contain sunscreen ingredients and will not protect the skin from the sun.

What is SPF?

Sun Protection Factor (SPF) compares the amount of sun needed to produce a barely noticeable redness on human skin when it is protected by a sunscreen to the amount needed when it is not protected. It indicates how much longer someone can be exposed to the sun after applying a sunscreen before getting a sunburn. For example, if it normally takes 10 minutes of sun exposure to get a sunburn, an SPF of 15 should protect you for 150 minutes. The protection provided by the product also can vary from person to person since some people burn more easily than others. Tests prove that the same dose of ultra violet radiation produces different degrees of redness in different people.

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The SPF can vary with the nature and amount of the sunscreening ingredient(s) in the product. It also depends on how much is applied to the skin, the ability of the product to reflect the sunlight and the geographical location of the sunscreen's user. The SPF is measured for each product and not simply calculated according to the quantity of sunscreening substance. An SPF of at least 15 is strongly recommended by Health and Welfare Canada. It blocks more than 92 per cent of UVB rays.

What is the difference between UVA and UVB protection?

Sunscreens generally protect against UVB rays, the radiation primarily responsible for most of the burning effects of the sun. Some products on the market claim to protect against the burning of the combined UVA and UVB radiation. The effects of UVA rays, such as photoaging and possible immunological changes, are more subtle and direct claims for these conditions have not yet been permitted for these products due to lack of supporting scientific information supporting such claims.

Health and Welfare Canada is reviewing a variety of methods used to measure UVA protection in order to create a UVA standard for assisting consumers in their selection of sunscreens. This process is in its very early stages because it was only recently that the health concerns associated with exposure to UVA radiation have been identified.

How should sunscreens be applied?

Health and Welfare recommends that a generous amount of sunscreen should be applied at least 20 minutes before going into the sun. This allows the product to soak into skin and helps minimize loss from swimming or excessive perspiration. Reapply the product after swimming or if perspiring heavily.

Conclusion

Protection from the sun's harmful rays is very important. Try to avoid the sun between 10:00 am and 3:00 pm. If you must be outdoors, stay out of direct sun if possible, wear a hat, adequate clothing, and sunscreen with an SPF of at least 15.

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Health Protection Branch

Issues

SAFETY OF EXPOSURE TO RADIOFREQUENCY ENERGY FROM CELLULAR TELEPHONES

Recent media reports that link the long-term use of cellular telephones to brain cancer have raised questions about the safety of exposure to radiofrequency (RF) energy from these devices.

Cellular telephones are radio transceivers which operate in the ultra-high-frequency (UHF) band. They receive radio transmissions from a central base station or cell-site at frequencies between approximately 869 and 894 MHz and retransmit their radio signal back to the base station at frequencies between 824 and 850 MHz. The portable units are of two types: hand-held or pocket phones with an output power of 0.6 watts, and higher power units with three to six watts of transmitter power. The higher power units may be carried in a small bag or case or installed in cars. The antennas of the hand-held or pocket type are about 10-20 cm long while those of the higher power units about 20-30 cm long.

Health Canada has established limits of exposure to RF energy based on a review of experimental evidence of detectable biological effects in animals and cell systems. The limits contained in Safety Code 6, last revised in 1990, have been set much lower than the threshold for the appearance of these effects.

Scientists at Health Canada tested a number of cellular telephones. Their test results show that the levels of RF energy from cellular telephones under normal operating conditions are below the limits of the Safety Code. The RF energy absorbed by the human head during the use of hand-held cellular telephones is estimated to be less than the maximum allowed level as specified in Safety Code 6. Recent data indicate that the absorbed RF energy is even lower with the hand in contact with the telephone.

It is known that absorbing RF energy above safe levels can cause harmful effects. There is currently no evidence of such effects from exposure to RF energy from cellular telephones. Some studies conducted with animals (at frequencies different from those of cellular telephones) suggest that lower-level RF energy may accelerate tumour development. However, the relevance of these findings is not clear; further research is needed to clarify this issue. Health Canada will continue to monitor the scientific literature and update the Safety Code if necessary.

Cellular phone users who are concerned about the safety of this device may reduce any potential risk by minimizing the use of the hand-held units and switching over to car-phone units or regular telephones as much as possible.

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Health Protection Branch

ISSUES

DRUG NAMES - WHO'S RESPONSIBLE?

Introduction

"What's in a name?" asks the famous question. If the name has anything to do with a drug product, what's in the name can be extremely important. Thousands of drug products are available in Canada; this has resulted in many drugs having strikingly similar names. The possibility of someone mistakenly taking one drug in place of another because the drug names are similar can have very serious consequences. So, why do such name similarities exist, and what is being done to ensure the safe delivery of drug products to Canadians?

Selecting Drug Names for a Global Market

Drugs usually have long and difficult chemical names. They are therefore usually known by their brand names. However, even these names may look and sound remarkably similar. Here are just a few examples of the many look alike/sound alike drug names: Tridil and Triavil - Iodyl and Ionil - Kalium and Valium - Kondremol and Condranol - Cisplatin and Carboplatin -Chlorpropamide - Chlorpromazine. While it may seem easy to eliminate the problem through more careful selection of drug names, the problem is anything but simple.

The World Health Organization (WHO) plays an essential role in assigning chemical drug substance names. The WHO is the world body coordinating the International Nonproprietary Name (INN) of each drug substance. Since 1972 more than 6,000 names have been assigned to chemical substances with possible medical uses. These names can be easily recognized by those involved in the drug development and delivery process such as chemists, toxicologists, manufacturers, physicians and pharmacists.

World-wide reference can then be made to a drug substance based on its INN name. The names submitted for INNs are examined by a committee with representatives from numerous countries and with abilities in many languages. Selected names are then checked against other INNs for similarity.

Trying to select names that are simple to use but still distinctive is extremely challenging. The most common practice is to keep substances with similar chemical composition or therapeutic uses as a "family". For example, the suffix "--cillin" is used for the penicillin family. If a drug substance can be placed in an existing family, creating a new name involves only the addition of a suffix, prefix or word fragment. However this leaves little room for creativity when developing new names within a family; there are presently 63 different "--cillins".

Since more than 6,000 names for drug substances have been assigned under the WHO program, it is understandable that similarities occur.

Same Name/Different Drug: Line Extensions

Similarities in name can also occur in "brand name" drug products. Many people have a favourite brand for the items they purchase. Brand loyalty is important to prescribers, consumers and manufacturers. By ensuring consistency and quality in products, manufacturers benefit by repeated sales and word-of-mouth recommendations. Likewise, consumers appreciate their favourite brand as a known entity, something that will perform to their expectations.

Perhaps nowhere is vigilance more important than when selecting a drug product. Consumers want and need safe, effective medication. But, because of a practice called "line extensions", consumers should pay very close attention to exactly what ingredients their favourite brand may contain.

Line extensions are quite common in the Canadian market; Anacin® and Anacin-3®, or 222® and 222AF®, are examples of line extensions. While the brand names of these products are very similar, the products themselves are very different. Line extensions can result in products with different active ingredients having very similar names. For example, the "222®" line of products contains ASA as the base ingredient, but "222AF®" contains acetaminophen as the base ingredient. So, although each product may be safely used as directed, consumers need to take care when selecting products. For those with physical sensitivities such as allergies or other medical conditions, appropriate product selection is particularly important. Likewise, when treating an overdose in an emergency setting, medical staff need to know precisely what active ingredients are involved in order to administer proper treatment.

Health Protection and the Helping Professions

Health and Welfare Canada has established a working group to examine the issue of look alike/sound alike drug names. This group is studying a number of issues including: product line extensions, similar brand names, similar generic names, use of abbreviations, and statistics regarding poison management and medication errors.

Health care professionals are also addressing the issue of look-alike/sound-alike drug names. The Canadian Medical Association, the Canadian Pharmaceutical Association and their provincial counterparts are actively involved in this issue. Through their publications they are striving to keep health care professionals aware of look alike/sound alike drug names. Renewed attention is being given to the importance of speaking and writing drug names clearly.

Taking Care - What You Can Do

Some easy steps can be taken to ensure you are taking the right product, appropriately. These can be followed whether you are dealing with an over-the-counter product or a prescription product.

- **Ask questions.** No matter what drug product you are purchasing, you should be informed. You should know what you are taking and why. Question your doctor and your pharmacist. For example: Why have you chosen this particular drug? Exactly what symptoms or condition will it help alleviate? Has this drug been on the market a long time? What should I watch for while I am taking this medication? You should know what you are taking and why.

- **Read labels.** Before buying or taking any drug products, read the labels carefully. Compare similar products and ask questions if there is anything on the label which you do not understand. Make sure you are aware of the frequency and amount of dosage recommended on the label; don't rely on memory even for a product you have purchased many times before. It is frequently not obvious from the names that two products contain the same active ingredient. Unless great care is taken, it is possible to consume a dangerous overdose by taking two such products at the same time (particularly if one is prescribed).

- **Double check.** Everyone can make mistakes, and everyone can help eliminate them. Double check with your doctor before leaving the office; what is the name on the prescription and exactly how is it spelled? After receiving your prescription verify the instructions printed on the label with the pharmacist. When you take a bottle from the medicine cabinet, ensure it is the correct one by checking the label carefully.

Who is Responsible?

The short answer is, everyone: government bodies, manufacturers, health care professionals and consumers. No simple answer will solve the complex requirements of naming drugs, so everyone must help ensure the safe use of drug products.

September 10, 1993

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Health Protection Branch

ISSUES

MENINGOCOCCAL DISEASE IN CANADA

Introduction

Meningococcal disease is an infectious disease caused by the bacteria *Neisseria meningitidis*, also known as the meningococcus. Fortunately, very few people are at risk for it, even when exposed. Infections caused by this bacteria can have varying effects in individuals. People may carry the bacteria without showing any symptoms of the disease. In this way, most people build up an immunity to the meningococcus.

Meningococcal Disease in Canada

There are five main groups of the meningococcus which cause infection in humans. In Canada today the most common is Group C. Meningococcal disease is rare in Canada with approximately 400 cases per year across the country. The majority of individuals - eighty to ninety per cent - recover rapidly after treatment with antibiotics.

The group at highest risk for meningococcal disease in Canada is children under two years of age. However, children two to four years of age and adolescents also have greater risk for the disease than adults. Seventy-eight per cent of the reported cases of meningococcal disease are in individuals under the age of 19. Between 1980 and 1987 the average number of cases per year was 224. The increase in cases over the last few years, in part, reflects a greatly improved monitoring and reporting system.

The discovery and use of antibiotics such as sulfa drugs and penicillin have dramatically improved the recovery rate from meningococcal disease. In 1986, for example, there were 18 deaths reported in Canada, compared to an average annual death rate of 119 during the 1920's.

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Symptoms and Risk Factors:

No special measures need to be taken in a community in order to prevent passing infection. Recreational and social activities such as sports, parties, movies and shopping can be continued as usual.

When someone is diagnosed with meningococcal disease, their casual contacts, such as classmates and co-workers, do not need preventative antibiotics. The bacteria is usually passed through close, personal contact from an infected person, perhaps, for example, by kissing or sharing cigarettes and drinking cups. After exposure to the bacteria through intimate contact most people do not develop the disease. However, for those that do, the incubation period is between two and ten days; three to four days is normal.

If serious illness develops, it may be very abrupt. After an initial period of flu-like symptoms such as cough, headache, and sore throat, a person will suddenly develop a spiking fever and chills. Painful joints and muscle pain may also occur. Usually a person then appears very ill and is often unable to sit or stand without great effort. A certain characteristic rash is very common in the more serious form of the disease. Individuals who develop a fever with the symptoms listed above should see a physician.

Treatment and Control of Meningococcal Disease:

Once a patient is suspected of having meningococcal disease, blood or cerebrospinal fluid specimens are sent for analysis to see if *N. meningitidis* bacteria are present. In the meantime, the patient is treated with antibiotics.

There are vaccines available for protection against certain types of meningococcal disease, including group C. Large scale immunization against meningococcal disease has not been used as a public health measure except in epidemic situations, where rates of disease were at least three times higher than rates seen anywhere in Canada in recent times. Unfortunately, the vaccine for group C meningococcal disease is not very effective among children who have the greatest risk for disease, children less than two years old. Based on evaluation of particular cases, some provincial health officials have recently chosen to carry out immunizations programs. Immunization as a public health option was evaluated at a consensus conference on meningococcal disease.

Meningococcal disease is a *reportable* disease in all provinces and territories, meaning that all cases must be reported to provincial and territorial authorities. Also, meningococcal disease is a disease which is *nationally notifiable*. Through an agreement between the provinces, territories and all public health authorities, all cases of the disease are recorded at a national level at the Laboratory Centre for Disease Control (LCDC) at Health Canada.

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October 14, 1993

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Health Protection Branch

ISSUES

CANADIAN HOSPITALS INJURY REPORTING AND PREVENTION PROGRAM (CHIRPP)

Background

Childhood injury is a serious problem in Canada. Unintentional injury is the number one killer of children and youth aged one to 19 years, accounting for over 40 per cent of the deaths in that age group.

On an average day in Canada, three children die from unintentional injuries, and it is estimated that for every death approximately 45 more children are hospitalized. That's at least 54,000 children whose injuries warrant hospitalization in a given year. While 50 years ago communicable childhood diseases were the greatest threat to our country's children, injuries are now our biggest health problem.

But these figures don't tell the whole story. They don't indicate how, when, where and why injuries occur and they don't help at all in reducing or preventing them. The great tragedy underlying these statistics is that most childhood injuries can be avoided through such measures as education and regulation. It is believed that if existing knowledge were widely applied, some 40 per cent of childhood injuries could be avoided. Some experts estimate that the results of current and future research will help to prevent 70-80 per cent of childhood injuries.

In the past, research on the problem of childhood injuries in Canada has consisted of individual studies done by various organizations, including government agencies, universities and health care facilities. The majority of these studies, while relevant, have been limited to specific injury issues or to relatively small groups of injury victims. In addition, data that were collected often focused more on the nature of the injuries and the need for treatment than on how the injury occurred.

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By the mid-1980s it was recognized that a coordinated approach to collecting nationwide data on the **circumstances** of **all types** of childhood injuries was necessary in order to safeguard our children against unnecessary debilitation and premature death. Health Canada responded to this pressing need for information by establishing the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) in 1989. Data collection began in April 1990.

Canadian Hospitals Injury Reporting and Prevention Program

The Canadian Hospitals Injury Reporting and Prevention Program is organized and administered by the Laboratory Centre for Disease Control. CHIRPP is a database system that monitors childhood injuries in collaboration with all 10 Canadian children's hospitals, as well as with five general hospitals (which collect injury data for all age groups). These 15 sites encompass major urban centres as well as two northern communities.

CHIRPP is based on a highly successful system of the same type in Australia called the Australian National Injury Surveillance Unit, which surveys injuries in all age groups. In the future, the compatibility of the two programs could lead to pooling and sharing of information.

Analysis of CHIRPP data enables us to set priorities and to target cost-effective injury prevention and safety promotion strategies. Through such comprehensive information regarding the circumstances leading up to an injury, researchers can discover patterns of injury occurrence and pinpoint particular problem areas which are amenable to intervention. As the CHIRPP database continues to grow, researchers will also be able to evaluate the effectiveness of these intervention programs.

How does CHIRPP actually work?

Whenever an injured child is brought into an emergency room of one of the participating hospitals, detailed information about the circumstances of the injury is recorded on a questionnaire by the parent or other responsible person accompanying the child. This includes the time and place of the injury and the factors that contributed to the event. In addition, the attending physician records the nature of the injury and whether the child was treated and released, kept for observation, or admitted.

Completed questionnaires are forwarded to Health Canada, where the information is coded and computerized. Confidentiality of the childrens' identities is assured. At regular intervals, the copies of computerized records are returned to the respective hospitals of origin for their own research. All participating hospitals have been generously provided, by Hewlett-Packard, with a micro-computer dedicated to injury research. In addition, Berol Canada has donated an abundant supply of pencils to be used for completing the questionnaires.

By September, 1993 there were more than 231,000 records of injuries in the CHIRPP database. The data are being used to provide brief responses to questions posed by health care workers and researchers, media, governments, non-governmental organizations, and the general public. In addition, CHIRPP staff undertake detailed studies on specific types of injuries, for example, injuries associated with trampolines and playground equipment, injuries that occur in daycare settings, sports injuries and thermal injuries. Under special circumstances, raw data from the computerized CHIRPP data base may be provided to researchers for their own projects.

Conclusion

The costs of childhood injury are high. In terms of the untold pain and suffering of injured children and their families, the costs are immeasurable. And financially, the burden is heavy. For example, the 1986 hospital expenditures for children's injuries in Canada have been estimated at $155 million. This figure does not include the ongoing costs of caring for people with lifelong disabilities or any out-of-hospital costs.

A surveillance program such as CHIRPP clarifies the trends and patterns of childhood injury, thereby facilitating the development and implementation of prevention strategies. Such strategies might include timely warnings to the public, education of parents and care-givers, changes to the environment and legislation.

CHIRPP provides the groundwork we need for a coordinated program of prevention and safety - with a built-in evaluation mechanism - which will help us to come to grips with the serious issue of childhood injury.

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Health Protection Branch

ISSUES

ASSESSING THE HEALTH RISKS OF PRIORITY SUBSTANCES UNDER THE CANADIAN ENVIRONMENTAL PROTECTION ACT

Introduction

Many Canadians are concerned about the impact of chemicals present in the environment. There are an estimated 25,000 to 30,000 substances currently manufactured or imported into Canada as well as hundreds of effluent streams and emissions released during industrial processes. Although many of these substances enhance our standard of living, some may also pose a risk to our health and our surroundings.

CEPA and the Priority Substances List

The Government of Canada established the Canadian Environmental Protection Act (CEPA) in 1988 to provide an effective way of identifying, evaluating and subsequently managing toxic chemicals. Under CEPA, Health Canada assesses the potential health effects of chemicals. Environment Canada assesses their environmental impact.

Since it is not possible to evaluate all substances at once, an advisory panel of environmental, industry, university and labour representatives was asked to compile a list of substances which, they felt, deserved the highest priority for assessment. The first Priority Substances List, announced in 1989, consists of 44 commercial chemicals, industrial effluents and emissions.

The assessment and management of these priority substances occurs in two distinct phases. Scientists must first determine whether a substance is "toxic" under Section 11 of CEPA -- their findings are made public in the form of assessment reports. Then, various control options are analyzed and implemented, where warranted.

Determining Toxicity

Under CEPA, a substance is defined as "toxic" if it enters or may enter the environment in amounts that may pose a risk to human health, to the environment, or to the biosphere that supports human life. Thus toxicity is a function of **both** the inherent properties of a substance **and** of the amounts or concentrations of the substance in the Canadian environment.

To determine whether a substance has the potential to cause harm to humans, information is gathered about its distribution in the environment. Health Canada estimates exposure within the general population based on levels that have been measured in air, water, soil, food and consumer products.

In parallel, the department conducts a thorough review of all the available toxicological information on the substance in question. Scientists at Health Canada examine data from short-and long-term studies involving laboratory animals, and from human population studies.

For each substance, scientists consider the types and severity of the observed toxic effects, the doses at which they occurred, and whether they were immediate or delayed, brief or prolonged, or irreversible. It is also important to consider whether the adverse effects observed in animals are relevant to humans.

"Threshold" versus "Non-Threshold" Substances

Most chemical substances cause adverse effects only when exposures exceed a certain level. Based on studies generally involving animals, scientists determine the lowest level at which adverse effects are observed. From this level or threshold, they calculate a Tolerable Daily Intake (TDI), a level that a person could be exposed to daily over a lifetime without harm. Because there are always uncertainties in using animal data to assess possible effects in humans, the TDI value of a substance is generally set at least 100 times lower than the threshold level observed in animals.

Health Canada declares a threshold substance "toxic", under CEPA, if Canadians take in or may take in amounts that exceed the Tolerable Daily Intake. On the other hand, if Canadians are exposed to amounts well below the TDI, a substance is deemed not to be "toxic".

(It should be noted that a substance deemed not to be "toxic" under CEPA could still cause harm if exposure increased to levels well above those generally found in the environment -- perhaps as a result of direct ingestion or inhalation. Also, caution must still be exercised in dealing with accidents such as spills, or when handling the substance in the workplace. Other federal and provincial programs exist to deal with such situations.)

In certain cases, it is inappropriate to set a TDI value. For some substances, including those that cause cancer or damage to the genetic material of cells, scientists are currently unable to determine a threshold below which people are absolutely free from risk. There is always some degree of risk, no matter how low the exposure. Accordingly, Health Canada deems all non-threshold substances "toxic" under CEPA, regardless of their levels in the environment. It should be noted, however, that the risk decreases as the exposure decreases.

How Toxic are "Toxic" Substances?

A substance labelled "toxic", under CEPA, does not necessarily pose a high degree of risk to Canadians. Risk is a function of both the "potency" of a substance -- its ability to produce a harmful effect -- and the levels to which people are exposed. Since chemical contaminants are often present in the environment at extremely low concentrations, the level of risk associated with them may be very small.

To compare the health risks of different non-threshold substances, such as carcinogens, scientists at Health Canada use an Exposure/Potency Index, or EPI. The more potent the substance or the higher its levels in the environment, the higher the EPI.

In this manner, it is possible to rank carcinogenic substances in order of priority for remedial action. EPI rankings indicate the relative urgency of dealing with different toxic substances. This does not mean carcinogens with low EPI scores are of no concern, but giving them immediate attention may not be warranted since there are higher risk substances requiring attention.

Determining whether a substance is toxic and estimating its EPI concludes the strictly scientific, or risk assessment, phase of the Priority Substances program. Since EPI scores can indicate only the relative health risks posed by non-threshold substances, not the absolute risks, they are important but are not sufficient indicators of the need to control these substances.

Managing Toxic Substances

The second phase of the Priority Substances Assessment Program begins with the analysis of different options for effectively controlling toxic substances.

Health Canada and Environment Canada, in consultation with stakeholders, analyze ways of controlling substances on a case by base basis, reviewing the health and environmental risks they pose, the availability of substitutes, technological, socioeconomic and other considerations. The departments then determine whether action is, in fact, warranted, and if so, recommend the most suitable control measures.

Depending on this analysis, controls may take the form of public education programs, guidelines, codes of good practice, and/or regulations. Controls may improve the safety requirements for the use of a substance, limit its use or the quantities that may be discharged into the environment, or ban the substance. Controls are never automatic, however. There may be no suitable alternatives to a substance, or the benefits it provides to society may far outweigh the risk it poses.

In the case of substances deemed carcinogenic, the need for further risk reduction measures should be reviewed on an ongoing basis, as new technologies become available and socioeconomic factors change.

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Issues

PESTICIDES -- A TEAM APPROACH TO SAFETY

Enhancing quality of life

Over the past few decades, a vast array of new pesticides - such as insecticides, herbicides and fungicides - have been developed to control or eliminate specific pests. These pesticides bring many benefits to Canadians, such as:

- keeping our homes pest free;
- keeping our lawns and gardens healthy and productive;
- protecting forests from pests that strip the foliage; and
- protecting croplands, so we have an abundant supply of reasonably priced food that's free of infection and disease.

If pesticides are used properly, they are unlikely to pose a risk to human health. However, every year, pesticide poisonings still occur, usually due to human error. Most of these cases involve young children exposed as a result of unsafe storage or use of pesticides in the home. The most important thing to remember for safe pesticide use is to read the label and follow the instructions - ultimately, it is up to you, the consumer, to use and store these products properly. Consideration should also be given to non-pesticidal alternatives whenever possible.

The label

The front panel of most pesticide containers has a symbol showing the degree and nature of hazard of the pesticide inside. For example the skull and cross bones symbol indicates a potential poisoning hazard.

The label also tells you about handling procedures for that particular pesticide, such as wearing rubber gloves, a mask, or even a respirator for more hazardous products. It also provides first aid information and, in some cases, emergency phone numbers for professional advice.

Canada

A few do's and don'ts

By exercising sensible care and caution as well as following label directions and any additional advice from your pesticide dealer, you can enjoy the benefits of pesticides while minimizing the risks — to yourself, your family or the environment.

- Don't smoke, drink or eat when handling pesticides;
- Store pesticides out of the reach of children, and do not spray around children or pets;
- Never store pesticides near food or drink, and never transfer pesticides into another container for storage;
- Wear protective garments as recommended on the label and remove contact lenses before spraying;
- Always wash your hands thoroughly after using pesticides;
- Clothing worn during pesticide use should be laundered alone, and not with other clothing;
- Dispose of pesticide containers in the manner indicated on the label;
- **For indoor use:** Empty any closets, cupboards or countertops you're treating and make sure there's adequate ventilation. Ensure any food preparation and storage areas are washed with potable water before re-using; and
- **For outdoor use:** As a general rule, spray on a windless day when the temperature is below 25°C.

Even when you take precautions, an accident can happen. If a spill occurs, immediately remove contaminated clothing and wash exposed skin with plenty of soap and water. In case of accidental ingestion, read and follow the first aid statements on the label immediately. Seek medical help or contact the regional Poison Control Centre listed on the first page of your telephone directory as soon as possible. Remember to take the label or container with you for quick identification and faster treatment.

Protecting your health and safety

Four federal government departments — Health Canada, Agriculture and Agri-Food Canada, Environment Canada and Natural Resources Canada — are involved in the registration and regulation process.

The federal government goes to great lengths to ensure that the pesticides used in Canada are safe, effective and properly labelled. Before pesticides can be used in this country, they must go through a federal government registration process that's among the most thorough in the world. All companies wanting to register a pesticide product must conduct and submit the results of laboratory and field tests that not only illustrate its effectiveness, but also its safety to human health and the environment. Pesticide manufacturers must submit:

- extensive toxicology studies;
- detailed data on anticipated human exposure;
- data on physical, chemical and environmental fate properties;
- the amount, frequency and times of applications; and
- information on the residue levels on food crops.

Health Canada's role

Health Canada is responsible for the safety of Canada's food supply. In addition, the department is responsible for the safety of persons who may be exposed to pesticides either during use or as bystanders near pesticide applications.

The levels of pesticide residues which may be present in the food we eat are carefully assessed by Health Canada. Many factors are considered in their assessment including identification of the type and amount of pesticide residues remaining on crops at harvest time, food consumption patterns, as well as the toxicity of the pesticide. After an in depth evaluation of all these factors, the department determines the amount of a pesticide residue, if any, that can be permitted on a food commodity without posing a health risk to consumers. Maximum residue limits are established based on good agricultural practises, when necessary, under the Canadian Food and Drug Regulations to ensure pesticide residues do not exceed these safe levels.

Health Canada is also concerned with exposure to pesticides by routes other than through food, namely through the skin and by inhalation. The department considers the toxicity of the product as well as the anticipated exposure in determining potential risks associated with the use of a pesticide. Recommendations are made on the ways to reduce potential risks. The use of precautionary statements on pesticide product labels is one example of how these recommendations are implemented.

Evaluating the risks to health from exposure to pesticides in drinking water is also the responsibility of Health Canada. The most likely reason for this occurring is pesticide leaching into groundwater or contaminating surface flows which are a source of drinking water. The potential health risks are evaluated considering the leachability of the pesticide, its stability in groundwater and surface water, and its potential health effects. The Guidelines for Canadian Drinking Water Quality are established and published by Health Canada in cooperation with the Federal-Provincial Subcommittee on Drinking Water. The department addresses human health risk assessment, risk management and environmental contamination issues under the Canadian Environmental Protection Act, Federal EARP Guidelines Order and the Canadian Environmental Assessment Act.

Only after all this information has been carefully reviewed and evaluated will registration for the use in Canada be considered. This process ensures that all pesticides sold in the country have passed rigorous standards. Even some pesticides that have been in use for a long time are being systematically re-evaluated to ensure that they meet today's high standards.

Health Canada works closely with Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, and provincial agencies who also have inspection and analytical programmes, to ensure that accepted residue levels have not been exceeded in food that's imported or produced in Canada. It directly inspects and analyzes domestic and imported food samples. In conjunction with other government departments, approximately 18,000 food samples are inspected each year. Any producer, processor, shipper or merchant that violates these regulations may be subject to federal prosecution.

Working together

The other federal government departments involved in the registration process follow procedures similar to those used by Health Canada. This extensive process ensures that pesticides can be used with minimal risk to humans, wildlife, fisheries and aquatic ecosystems.

The provinces also play a role. For example, provincial departments of agriculture or the environment advise farmers about application and spray programs, assist in pesticide control and regulate manufacturing, storage, disposal and transport.

Making the system more effective and efficient

The federal government has recently announced that the pesticide regulatory system is under revision to enhance the protection of human and environmental health, while continuing to ensure that Canadians have access to effective pest management tools. One of the goals of the revised regulatory system is to make it more efficient and accountable to the public.

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March 11, 1994

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Issues

NONMEDICINAL INGREDIENTS ON DRUG PRODUCT LABELS

Health Canada has proposed changes to the Food and Drug Regulations, which would require pharmaceutical manufacturers to list all nonmedicinal ingredients on the labels of their drug products.

Researchers have confirmed that a link exists between nonmedicinal ingredients in drug products and adverse reactions in people with particular allergies or sensitivities. The new labelling requirements would allow these individuals to avoid products that may cause adverse reactions. The list of nonmedicinal ingredients would also help health care professionals identify ingredients that may be causing reactions in their patients.

The federal government defines nonmedicinal ingredients as substances, other than a medicinal ingredient, added to a drug during its manufacture and present in the product when sold. The lists would include colours, types of flavouring agents and ingredients of other elements such as capsules. The government would allow manufacturers to include only the word "fragrance" in their lists without identifying exactly what fragrances they use. These ingredients would be listed in alphabetical order.

These changes reflect the consumer's demand for more information. The new regulations would allow people to participate in health care decisions. As well, people with special dietary requirements or preferences would be able to determine which products to avoid.

Although the new amendments would go into effect as soon as the regulation is passed, manufacturers with products already on the market would have two years to carry out the labelling changes. This would allow them to use up their stocks of labels, cutting down on costs. Manufacturers of new drug products would have to include the new requirements on their initial labels. Health Canada believes that the benefits of these new regulations to consumers would outweigh the cost of relabelling.

Some manufacturers may have additional costs when they reformulate products to remove nonmedicinal ingredients known to cause adverse reactions or ingredients otherwise unacceptable to consumers.

Canada

Health Canada government forecasts that increased consumer awareness would reduce the number of adverse reactions and allergic incidents. This translates into savings for the health care system. Society would also benefit by avoiding the loss of productivity caused by illness from serious adverse reactions.

The proposed regulations would also require manufacturers to supply a list of nonmedicinal ingredients when applying for a Drug Identification Number (DIN). This would ensure that Health Canada has up-to-date information on all nonmedicinal ingredients.

Health Protection Branch (HPB) inspectors would enforce the new regulations through surveillance. As well, HPB officers evaluate labels of drug products before issuing a DIN which manufacturers need on their labels to market their products.

The same changes would apply to veterinary drug products for injectable use only.

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Nonmedicinal Ingredients on Drug Product Labels is one of a series of Issues produced by the Health Protection Branch of Health Canada for the public, media, and special interests groups.

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Issues

VAGINAL ANTIFUNGALS

Introduction

Schedule F of the Food and Drug Regulations has been amended to permit certain topical antifungal agents, namely clotrimazole, miconazole and tioconazole, for the treatment of vaginal yeast infections (vulvovaginal candidiasis or VVC) to be made available without a prescription.

Why is a Prescription no Longer Necessary?

Health Canada considered the nature of the diseases to be treated, the effectiveness for the proposed nonprescription uses, and the safety record of these specific ingredients.

VVC is a benign disease that is usually self-limiting. It was well established that most women who have had their first episode of VVC diagnosed and treated by a physician are able to accurately diagnose subsequent episodes.

The ability of the consumer to self-diagnosis and self-treat the condition, a high cure rate and a large safety margin were the main reasons for reclassifying clotrimazole, miconazole and tioconazole as nonprescription drugs. A comprehensive analysis of the benefits versus the potential risks determined that, with appropriate label instructions and detailed consumer information brochures, these drugs can be used safely and effectively by the public in the absence of direct supervision by a physician. Unlike most other categories of nonprescription drugs, which treat the symptoms but do not alter the course of the disease itself, the antifungal agents will effect a cure in a large majority of individuals.

Who Will Benefit by the Switch to Nonprescription Status?

The consumer will benefit by having easier access to these products and the convenience of self-medication. The burden on the health care system will be reduced because repeat visits or calls to the physician will no longer be necessary in all situations. Women will be able to assume greater responsibility for their own health care and treatment of this relatively common condition.

Canada

Who was Consulted in Making the Decision to Reclassify these Antifungal Agents as Nonprescription Drugs?

The provincial Ministries of Health, medical and pharmacy licensing bodies as well as expert advisory committees on dermatology and reproductive physiology were consulted prior to making this decision. The regulatory proposal was published in the Canada Gazette, to provide an opportunity for comments from all interested parties. The consensus supported the removal of clotrimazole, miconazole and tioconazole from Schedule F.

Are there any Consequences in Delaying Treatment

Yeast infections of the vagina cause discomfort but no serious health consequences if treated promptly. The symptoms are often severe enough to cause the individual to seek medical treatment.

Are there any Side Effects by Incorrectly using these Products?

If used according to labelling instructions, these antifungals have no misuse or abuse potential and are associated with a low incidence of generally minor, and usually transient, side effects. Since these antifungal agents are not absorbed to any significant extent through the skin or the lining of the vagina, no dangerous blood levels can be reached. If an incorrect diagnosis is made by the consumer, the symptoms will not respond to self medication with the antifungal agents, and the individual will seek medical advice.

What Type of Preparation and Treatment Regimen Should Use?

Vaginal preparations will be sold as either suppositories, inserts, ovules, or creams. Each of these preparations may contain different levels of medication and may be recommended to be used for only one day, for three days or for six to seven days. In this respect, Canada differs from the United States where only seven day treatment regimens have been made available as nonprescription drugs.

It is important that the products be used for the duration recommended in the specific product labelling and that treatment continue for the period specified, even if symptoms are no longer present, in order to minimize the chances of reinfection. All treatment regimens are equally safe and effective and the choice of product is a matter of personal preference. The consumer may decide which product best suits her needs. A pharmacist or physician should be consulted if in doubt.

Although vaginal yeast infections do not generally spread to the male sexual partner, cream applied to the penis may help prevent reinfection. General hygienic measures and avoidance of tight and/or synthetic underclothing are also important to successful treatment.

What Measures have been taken to Ensure that these Products can be used Safely by the Public?

Warnings on the product labelling and explicit instructions for diagnosis and self-treatment are important to patient safety.

In addition, the labelling directs the patient to consult with their physician or pharmacist when:

- Symptoms are being experienced for the first time.
- Symptoms have not improved or worsen or if new symptoms appear within a certain time frame or if the condition recurs frequently.
- A woman is pregnant or thinks she is pregnant or is nursing a baby.
- A women believes herself to be at increased risk for sexually transmitted diseases, i.e., have multiple sexual partners or change partners often.
- Pain, fever or a foul-smelling vaginal discharge is present since not all vaginal infections are caused by yeast.

Are Some Women at Higher Risk of Getting Vaginal Infections?

Conditions that make vaginal yeast infections more likely to occur are illness and use of antibiotics (these drugs do not affect yeast) as well as changes in hormone levels such as those that may occur during pregnancy, with the use of oral contraceptives, or just before menstruation. Hot humid weather, continuous use of panty liners or tight, non-breathing clothing may also increase the chances of developing a yeast infection. These infections are usually not transmitted through sexual relations, even though a small percentage of male partners do have infections at the same time.

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Vaginal Antifungals is one of a series of Issues produced by the Health Protection Branch of Health Canada for the public, media, and special interest groups.

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ISSUES

GENERIC DRUGS

Introduction

The use of generic drugs is wide spread in Canada today. Generic drug is a term for products that contain the same medicinal ingredient(s) as the original brand name drug. These products compete on the basis of price. Nearly thirty percent of all prescriptions filled by pharmacies use a generic brand and hospitals purchase generic drugs extensively. Chances are that you have received a generic drug at some time.

Health Canada is responsible for evaluating generic drugs and does so by focusing on the drugs' safety, efficacy and quality. The current comprehensive evaluation of drug products prior to their marketing has been in place for almost thirty years and it applies equally to brand name and generic drugs. While the requirements of safety, efficacy and quality have remained essentially unchanged over the years, Health Canada's evaluation criteria have evolved with the changing frontiers of science. All drug products are evaluated, and although some requirements for generic drugs are different from those for brand name drugs, most are identical.

The Content and Manufacture of Generic Drugs

Requirements for ingredients, manufacturing processes and facilities apply to all manufacturers. This means that when any manufacturer produces a drug for sale in Canada, the entire operation must meet the federal guidelines for Good Manufacturing Practices. Furthermore, all manufacturers must perform a series of tests, both during and after production, to show that every batch of a drug being produced meets the specifications for that product.

Canada

Key specifications concern the ingredients in the drug. The substance which causes the therapeutic action is called the "medicinal" or active ingredient. During the manufacture of medicinal ingredients small amounts of impurities may be produced. Manufacturers must establish limits for any impurities which may remain after purification, and show that the presence of these low levels of impurities do not affect the safety and efficacy of the ingredient. Manufacturers of drugs, including generic brands, must conduct chemistry studies to establish, to the satisfaction of Health Canada, that the medicinal ingredient being used meets acceptable standards for identity, quality, purity and potency.

While competing brands must have the same amount(s) of medicinal ingredient(s) of acceptable quality, other ingredients are also incorporated into the product. These are termed non-medicinal ingredients and give the product its shape and colour. Non-medicinal ingredients in generic products may differ from those of the original brand. However, over the years, the use of many non-medicinal ingredients has become established and manufacturers typically choose from among these known substances. Studies are normally required to verify that the different mix of non-medicinal ingredients and manufacturing conditions do not change the performance of the medicinal ingredient(s).

The Testing of Generic Drugs

Generic drug manufacturers are given two major options to demonstrate the safety and efficacy of their product(s). One is to repeat the majority of the chemistry, animal and human studies conducted by the manufacturer of the original brand. Another is to compare the performance characteristics of the medicinal ingredient(s) of the generic drug with those of the original brand.

This latter option is normally chosen as the original brand has already been established as a safe and effective drug product when used according to directions. Therefore, if a generic product, that has been fully tested for identity, quality, purity and potency, and manufactured in compliance with federal Good Manufacturing Practices is shown to release the medicinal ingredient(s) into the body in the same manner as the original brand, it is considered to meet the federal standards for safety, efficacy and quality. These studies are termed *comparative bioavailability studies* because they compare the availability of the medicinal ingredient(s).

Comparative bioavailability studies are normally conducted by measuring the level of drug in the blood of healthy human volunteers with each study subject receiving both the original brand and the new generic brand on two separate occasions. The generic drug must demonstrate that it can deliver the same amount of drug at the same rate as the original brand. The number of volunteers required for a study depends on the characteristics of the drug product under study. On this basis the therapeutic effects of the two products should be the same since the effect of a drug depends on the levels of the medicinal ingredient(s) in the body.

Some products may not be suitable for comparative bioavailability testing. In these cases, other methods, such as comparing the clinical effect of the generic drug with the original brand, may be used. Generic drugs that are solutions and are administered by direct injection into the blood stream are not suitable for a comparative bioavailability study because the rate and extent at which the medicinal ingredient(s) enter the body are not dependent upon the formulation but will be controlled by the person giving the injection. Products applied topically to the skin are another example: the levels of medicinal ingredients entering the body through the skin may be technically difficult to measure and therefore unsuitable for comparative bioavailability testing.

In their evaluation of drug products, Health Canada's scientists draw on their extensive experience in the assessment of safety and efficacy with bioavailability studies. In addition, the advise of an expert panel of scientists, physicians and pharmacists from across Canada is used to ensure the continuing high standards for drug products available on the Canadian market.

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ISSUES

ELECTROMAGNETIC DEVICES

Introduction

Electromagnetic devices sold for home use are often represented as cure-alls and miracle cures. Some promoters make claims that are not scientifically verifiable and are therefore illegal and deceptive. The Health Protection Branch has received numerous complaints from people who purchased electromagnetic devices and found them to be ineffective.

These devices usually consist of an electrical control unit or generator, and come with attachments such as local applicators or pads, and cylinders and rings that can be placed around the body or limbs. They can sell for up to five thousands dollars ($5000.00).

Tactics used to promote the sale of these electromagnetic devices include newspaper and magazine ads, word of mouth advertising, and private and public meetings where users of the device, often distributors themselves, present moving and effective testimonials. The promoters often try to imply that the medical profession is trying to prevent access by the public to this therapy while giving the erroneous impression that their claims for the devices are scientifically valid.

Consumer, be aware

Consumers should be suspicious of electromagnetic devices that are advertised as an effective treatment for almost every type of ailment, including chronic pain and serious diseases. As well, these products may be misrepresented, and wrongfully promoted, as useful for a wide range of conditions, for example:

- improving blood circulation;
- relaxing the nervous system;
- producing anti-inflammatory effects;
- stimulating cell repair and regeneration;
- not only alleviating symptoms but also influencing the profound causes of illness;
- helping the human body maintain and improve health by reinforcing the body's natural defence and healing mechanisms;

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- helping in the process of detoxification, activating the elimination of toxins;
- treating anxiety, arthritis, arthrosis, arteriosclerosis, asthma, back, knee and shoulder pain, burn-out, bursitis, chronic fatigue, depression, diabetes, eczema, hypertension, hypotension, inflammation, insomnia, kidney stones, migraines, phobias, psoriasis, ulcers, etc..

These types of claims are false and misleading! The effectiveness of electromagnetic fields has only been demonstrated in the promotion of bone regrowth in non-healing bone fractures, with a specialized electromagnetic device, and following a controlled scientific protocol for this purpose. Non-healing bone fracture is not a common condition and is usually treated under medical supervision. The fact that there is one recognized medical use for this type of device under very specific conditions **does not make this type of therapy effective for any other type of ailment.**

The majority of these devices do not pose a direct health hazard to the user. Nevertheless, they can pose an indirect hazard if they cause a patient to delay seeking proper medical treatment for a serious condition. In any case, there is always an economic loss to the user. Additionally, consumers are often upset when the expected results are not obtained and they realize that they have been deceived.

Role of the Health Protection Branch

All medical devices sold in Canada must comply with the Medical Devices Regulations of the Food and Drugs Act. Although the Health Protection Branch does not routinely test devices for safety and effectiveness, manufacturers are required to do so.

While the Branch has the authority to investigate medical devices problems and to stop the sale of devices when necessary, the Branch concentrates its efforts and resources to serious problems, where there is potential for injury. Problems of a less serious nature, such as deceptive claims, are usually addressed through educational efforts such as this ISSUES document.

What you, the consumer, can do

◆**Consult your family physician or other health care professional if you have a medical problem and are considering buying a device of this type.** This will ensure that your problems are treated promptly and properly, and not allowed to deteriorate to an untreatable state. By obtaining professional medical advice you may also save a considerable amount of money and avoid the potential disappointment of being misled.

◆**Be sceptical of electromagnetic devices that claim to treat a wide variety and range of ailments** with cures that are quick, painless, simple and miraculous. Ask for all the promotional material for the product. Read the information carefully. Remember that the only medically recognized application of electromagnetic devices is for the promotion of bone regrowth in non-healing bone fractures, and only if the device is specially designed for this purpose and used under specific conditions. (These devices are not usually advertised to the general public.) Any other claim is false and misleading. Beware of personal testimonials. In most cases, testimonials have not been supported by scientific or medical evidence, and should not be accepted as proof that a product is effective. Also, ***be suspicious of claims that the therapy or the product is commonly used in other countries***. Other countries may have less stringent regulatory requirements and may not require that claims be supported by data.

◆**Remember that statements such as "Duly registered/Notified with Health Canada"** are no indication that the product is endorsed or approved by the Department, but might be used to mislead the consumer into believing that they are. These statements simply mean that the manufacturer has informed Health Canada that a device is being offered for sale in Canada, which manufacturers are required to do by law. Notification is not approval by Health Canada.

◆**Do not hesitate to report any complaints and concerns** about electromagnetic devices or other suspect medical devices to your local Health Protection Branch Regional Office. You can also report problems with medical devices to the toll-free Medical Devices Hot-line at 1-800-267-9675.

In short, **be suspicious of aggressive, miracle cure advertising promoting expensive products,** and most importantly, remember that **if it sounds too good to be true, it probably is!**

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ISSUES

ASSESSING THE HEALTH RISKS OF BIOTECHNOLOGY PRODUCTS UNDER THE CANADIAN ENVIRONMENTAL PROTECTION ACT

Introduction

Long before the "discovery" of bacteria, yeasts and moulds, humans were using them to make bread, cheese, yoghurt, wine and beer. For several decades, we have also relied on microorganisms to perform such tasks as the production of antibiotics and the treatment of sewage. And now, using powerful new techniques for manipulating cells and genes, scientists are designing and tailoring microorganisms for use in agriculture, forestry, mining and other industries.

While Canadians generally support the "biotechnology revolution", many people are concerned about the consequences of releasing novel microorganisms into the environment. To minimize the potential risks associated with commercial applications of biotechnology, the federal government has established a regulatory framework that involves several different Acts including the *Canadian Environmental Protection Act (CEPA)*, which was launched in 1988.

What is CEPA?

The goal of CEPA is to protect the environment and human health from potentially "toxic" substances. Biotechnology products -- i.e. naturally occurring and genetically engineered microorganisms and their products, such as biochemicals and enzymes -- are specifically included among the substances to be assessed and controlled under CEPA.

CEPA addresses biotechnology products that are not already regulated under other federal acts, such as the *Pest Control Products Act*. Some of the applications that fall under the CEPA umbrella include chemical production, energy production, mineral leaching, snow-making, drain-cleaning, and the destruction of toxic wastes.

Canada

CEPA includes provisions to prevent new biotechnology products being manufactured in, or imported into, Canada until the federal government has assessed their effects on human health and the environment. Using data supplied by biotechnology firms, scientists at Health Canada and Environment Canada assess whether a product is "toxic", as defined in the Act. If there is no indication of toxicity, commercialization of the product can begin. However, if there are reasons to suspect that the product may be "toxic", the federal government may ban or impose controls on its use, or request further information.

Determining Toxicity

A biotechnology product is deemed "toxic", under CEPA, if it enters or may enter the environment in amounts that may pose a risk to human health, to the environment (e.g. wildlife), or to the environment on which human life depends.

To determine whether microorganisms, and other biotechnology products, are "toxic" to human health, scientists at Health Canada evaluate the potential hazard they pose as well as the potential exposure of Canadians. The key to hazard identification is to accurately identify the microorganisms involved, including any genetic modifications.

Under the proposed CEPA notification regulations for biotechnology products, firms must provide the names of the species they propose to use, indicate whether these microorganisms have been associated with any adverse health effects and determine whether they are related to any known pathogens. They must also test the susceptibility of the microorganisms to antibiotics. Depending on the scale of use, firms may also be required to test the microorganisms for pathogenicity using valid test procedures.

To assess the potential exposure of Canadians, scientists consider the number of people who are likely to use the product, the number of microorganisms within the product, and their anticipated fate and persistence after the product is used. Other considerations include information on the source of the microorganisms and the degree to which humans have previously been exposed to them. Scientists also look at whether certain uses of the product could lead to unusual levels or routes of exposure, such as the inhalation of large numbers of microorganisms.

An Ongoing Responsibility

The federal government's commitment to protecting human health from the potential risks of biotechnology products does not stop with the initial assessment of a product. Scientists will continue to monitor the health effects of biotechnology products long after they have been initially approved for use. For example, biotechnology companies are required under CEPA to report any new findings that may affect the status of their products. These provisions are designed to ensure that the benefits of biotechnology in Canada far outweigh the risks.

Further Information

The following related publications are available from Health Canada:

Protecting Human Health Under the Canadian Environmental Protection Act
(Cat. No. H49-77/1992)

Human Health and the Canadian Environmental Protection Act (CEPA) Issues

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Assessing the Health Risks of Biothechology Products Under the Canadian Environmental Protection Act is one of a series of Issues produced by the Health Protection Branch of Health Canada for the public, media, and special interest groups.

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ISSUES

SUNGLASSES

Introduction

The earth's ozone layer protects all life on earth from excessive exposure to the sun's ultraviolet radiation (UV). The thinning of the ozone layer has allowed the amount of UV reaching the earth's surface to increase. Protecting ourselves from the sun's harmful rays when working or playing outside is prudent and easy to do.

The best protection is to stay in the shade, wear protective clothing and a hat with a broad brim. Apply sunscreen with an SPF of at least 15 to exposed skin. This advice is true for adults and especially true for children's more tender skin.

Your eyes may also need protection from UV and strong light.

Light and UV

Light is a form of energy called electromagnetic energy. It travels through space like a wave. The electromagnetic spectrum includes a very wide range of energy wavelengths. Only a part of the spectrum is visible to our eyes as light of different colours. Our eyes perceive this as a gradation of colour from violet through blue, green, yellow and orange to red.

Although the sun is the most important source of light for the earth, it is also a powerful source of electromagnetic energy outside the visible range of the spectrum. Only 45 percent of the sun's energy reaches the earth as visible light. The rest is invisible radiation.

The invisible solar radiation has two forms--Infrared (IR) and Ultraviolet (UV)--and the eye absorbs both. Infrared light rays have longer wavelengths than visible light. They are the thermal or heat carrying rays. Fifty percent of the sun's energy reaches the earth as heat or infrared radiation. Infrared rays carry less energy than visible light.

Canada

The earth's atmosphere absorbs much of the ultraviolet radiation from the sun. Only five percent of the sun's energy reaches the earth in the form of UV radiation. Its wavelength is shorter than visible light, but it carries more energy. The UV band further divides into UV-C, UV-B and UV-A. The atmospheric ozone layer absorbs UV-C rays so they do not reach the earth's surface.

UV and the Eye

UV-B rays produce tanning of the skin and can also cause skin cancer. They can cause or accelerate the progression of several diseases of the eye or its supporting structures. UV-A rays are also harmful to the eye. The thinning ozone layer and our longer life span have increased the risk of both high-intensity short-term exposure and low-intensity long-term exposure. Most of the harmful effects of UV-B and UV-A absorption by the eye are cumulative over a lifetime. Thus, the damaging effects build up steadily and do not reverse themselves. Some individuals are more sensitive than others to UV.

When light is absorbed, it causes heat or chemical reactions. These reactions can damage the eye if the amount is beyond the eye's natural capacity to repair itself. As UV rays have more energy than visible light, the potential for damage is greater with UV ray absorption to the same tissue. The outside tissue layer of the eye, the cornea and the conjunctiva, absorbs UV-B. The lens absorbs mainly UV-A. The retina, the non-transparent tissue at the back of the eyeball, absorbs visible light. If there is too much UV in the environment, the front parts of the eye suffer injury. If visible light is too intense, the retina can be injured and vision may be permanently lost. This is what happens when someone stares directly at the sun for more than a few seconds.

UV radiation, along with wind and drying of the eye, may cause **snowblindness** (exposure keratitis and conjunctivitis), an uncomfortable but temporary condition. There is also some evidence that the risk of **cataracts** (a gradual clouding of the lens of the eye) may increase with regular daily exposure to UV in very bright sunlight over many years, especially when reflected off large surfaces like water. However, not all scientists agree on this issue. Some individuals are more prone to develop cataracts than others, and this may be unrelated to UV exposure.

Another possible area of damage is from blue light--visible light in the blue portion of the spectrum. The eye doesn't focus blue wavelengths as precisely as it does other colours, but the brain adjusts visual perception for minor blur from blue light. There is no proof that "blue blur" damages the eye. Studies have shown, however, that the retina can suffer *photochemical* damage caused by shorter wavelengths of visible light--the blue end of the spectrum. Some scientists now believe that routine outdoor exposure to blue light over many years may age the retina and add to **macular degeneration** in sensitive individuals. This is a disease of the retina that is the main cause of blindness in people over 60. Other scientists, however, view these fears as exaggerated.

Why Wear Sunglasses?

Properly chosen sunglasses can help your vision by reducing glare, improving contrast and making you feel more comfortable when out in the sun. Contrast enhancement is produced by sunglasses that cut out blue light. This can improve your safety when driving or playing sports.

Sunglasses can also help to prevent some direct damage to the eye from light. Sunglasses that absorb at least 75 percent of visible light--which would include most models--provide enough blue-light protection without distorting vision. If you spend extended time in an environment with intense glare, such as on snow or water, then sunglasses that block blue light are recommended. Amber-coloured lenses block blue light and increase the clarity of distant objects in blue haze (such as in the mountains). However, they may not reduce the intensity of sunlight enough for someone to be comfortable.

Years ago, studies reported that many brands of sunglasses did not block out much UV. This prompted concern that people might sometimes be better off *without* sunglasses. The concern arose because sunglasses, in shading eyes from the sun, make the pupils dilate. If the lenses did not screen out UV, more UV would enter the eye through wider pupils than if no sunglasses were worn. That fear now appears unwarranted. Even very dark sunglasses cause the pupils to dilate only slightly. Tests show that current sunglasses block far more than enough UV to make up for any pupil dilation.

Do not use sunglasses to look at the sun-- only a welder's mask shade #14 can be safely used for that purpose. **Never** stare at the sun. It takes only 10 to 15 seconds for the sun's image to burn our eyes. This usually results in permanent loss of vision.

How to Choose Sunglasses

For comfort, choose sunglasses with lenses dark enough for the brightness in which you'll wear them, but not so dark as to interfere with vision. The brighter the environment (like skiing at high altitudes or water sports), the darker the lens you will need. Most sunglasses, however, will be comfortable over a wide range of brightness.

Lens types: **Regular** sunglass lenses reduce the brightness of everything quite uniformly. **Polarizing** lenses work specifically to cut glare due to reflection--sunlight that bounces off smooth surfaces such as water or snow. Polarizing sunglasses are therefore good for driving. They can also be useful for fishing, as they make seeing into water much easier. They block most of the light reflected off the water at certain angles.

Photochromic lenses respond to the intensity of UV--darkening outdoors and lightening indoors. Typically, most of the darkening takes place in about half a minute, and most of the lightening in about five minutes. These lenses are also temperature-sensitive, darkening more in cold weather than in hot. Photochromic lenses come in either a uniform or a gradual tint. If you plan to use them for driving, choose ones that are already fairly dark. They won't darken as much in the car, since the roof and windows block much of the UV.

"**Flash**" or **mirror** lenses reflect all or part of the unwanted light instead of just absorbing it as regular sunglasses do. They offer no inherent performance advantage over ordinary lenses. The metallic coatings scratch easily, so a scratch-resistant coating is desirable.

Most lenses these days are **plastic**. Thin lenses are always plastic as it is tougher than **glass** and thus more resistant to breakage. Very thin glass wouldn't withstand impact tests. **Polycarbonate plastic**, used in sports sunglasses, is particularly tough but fairly easy to scratch and may shatter if hit. Glass lenses don't scratch much, but they're heavier. If you buy polycarbonate lenses, look for ones with scratch-resistant coatings.

And it's wise to check that the lenses are free of **distortion** before you buy. Put them on and look at a rectangular pattern, such as floor tiles. If the lines stay straight when you move your head up and down and side-to-side, the distortion is negligible.

For occupations where direct sun exposure is required for extended periods of time, it is recommended that wrap-around or side-shield sunglasses be used.

Standards for UV Protection

It's not necessary to buy high-priced brands to get good UV protection. Most sunglasses now on the market block a large percentage of UV radiation. However, they do not all block the same amount of UV. You can't always tell how much UV radiation a pair of sunglasses will block based solely on the colour of the lenses or their darkness.

Many manufacturers follow voluntary industry standards for the labelling of sunglasses. Three such standards are ANSI Z80.3, published by the American National Standards Institute, the UV Labelling Program of the Sunglass Association of America, and the CSA Standard Z94.5 for Nonprescription Sunglasses which will soon be published by the Canadian Standards Association. Sunglasses complying with these standards have tags or stickers that tell you in which group the sunglasses belong - cosmetic, general purpose or special purpose. The standards set UV blockage requirements for each group.

Cosmetic sunglasses usually have lightly tinted lenses for use in non-harsh sunlight and block anywhere between 0 and 60 percent of visible light and UV-A. They must also block between 87.5 and 95 percent of UV-B. Cosmetic lenses are not recommended for daylight driving unless specifically indicated by the manufacturer.

General purpose sunglasses must block between 60 and 92 percent of visible light and UV-A. They must also block between 95 and 99 percent of UV-B. Sunglasses with general purpose lenses are recommended on days where harsh light from the sun forces the eyes to squint. These lenses are appropriate for driving.

Special purpose sunglasses may block up to 97 percent of visible light. They must block at least twice as much UV-A as they block visible light, which may be up to 98.5 percent. They must block at least 99 percent of UV-B. Special purpose sunglasses are not recommended for driving. They may be labelled as suitable for high and prolonged sun exposure.

Recommendation

You don't have to go high-tech to get comfort and versatility. Polarizing lenses, which reduce glare from reflection, are particularly useful for driving. A neutral, uniform-shaded lens is a good all-around performer. Medium-to-dark lenses with a grey, or slightly brownish or greenish tint, will filter out most blue light with little distortion in colour perception. You can find all of those qualities in many inexpensive pairs of sunglasses.

It makes sense to wear sunglasses when it's sunny--both for comfort and to reduce any risk from UV and blue light.

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